▶ EXCLUSIVE

Users hit Vtam wall

BY PAUL KORZENIOWSKI
Senior Wnter

A handful of the nation's largest financial institutions have run into a brick wall as they try to expand their IBM Systems Network Architecture networks. Several more may encounter the same dilemma.

The wall is an incompatibility problem between the latest versions of IBM's Virtual Telecommunication Access Method (Vtam) and an older product the companies have been using, IBM's Transaction Processing Facility (TPF).

The problem, to which IBM has admitted, has created major headaches for users. A large California-based bank, which declined to be identified, cannot add any hosts, front-end processors, terminals or automated teller machines to

Continued on **page 8**

▶ SATELLITE TRANSMISSION

AT&T tips Vsat hand

BY BOB WALLACE
Senior Writer

In a move that may blow open the Very-Small Aperture Terminal (Vsat) network market, AT&T Communications last week filed to offer users a point-to-multipoint, digital data and video communications satellite service beginning April 17.

The entry of AT&T into the transmit/receive Vsat marketplace may help the company retain its customer base.

In the last six months, some of its customers have cast off their AT&T leased lines in favor of satellite-based networks.

Continued on **page 43**

NETWORK WORLD

THE WEEKLY FOR LEADING USERS OF COMMUNICATIONS PRODUCTS & SERVICES VOLUME 3, NUMBER 3 MARCH 24, 1986

▶ MULTIVENDOR NETWORKING

Users force LU 6.2 issue

Companies wield buying power to hasten vendor adoption of SNA tool.

BY JOHN DIX
Senior Editor

Large corporations have begun to wield their purchasing power to pressure vendors into supplying IBM LU 6.2-compatible products in an effort to simplify the job of networking disparate types of computers.

Part of IBM's Systems Network Architecture, LU 6.2 is an interface specification that is amassing broad industry support as a common point of vendor compatibility. By requiring compliance with LU 6.2, users are alleviating many network incompatibility problems.

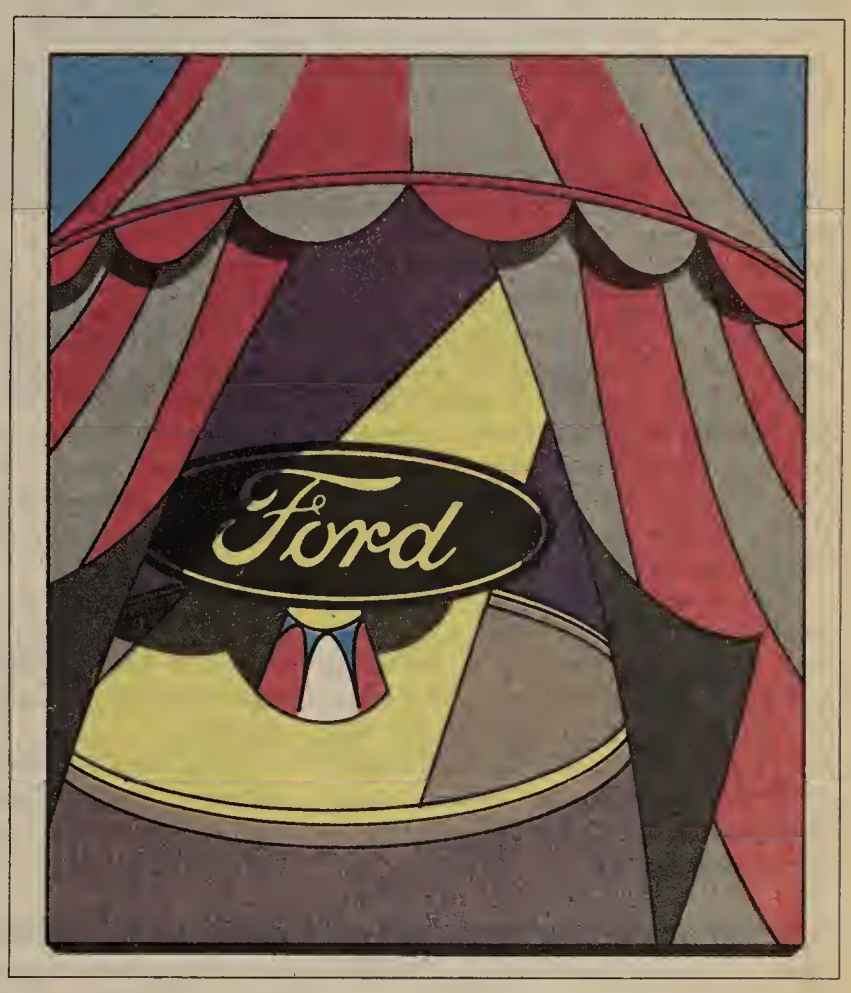
General Electric Corp. now mandates that its office system vendors support LU 6.2 — or show they have people working on development of LU 6.2 compatibility, according to Bruce Compton, manager of office systems and technology with GE's Information Systems division.

Although United Airlines and Bankamerica Corp. have not adopted LU 6.2 as a formal product-procurement standard as GE has, both admit LU 6.2 support weighs heavily in purchase decisions.

Robert Sundstrom, manager of communications systems architecture with IBM's Communications Products Division at Research Triangle Park, N.C., said that, as a program interface, LU 6.2 defines how an application in one processor can access data from a program in another processor. Sundstrom said LU 6.2 can also be viewed

Continued on **page 7**

▶ MANUFACTURING



Technology drives Ford

BY MARGIE SEMILOF
Senior Writer

Ford Motor Co. will take a back seat to no one in the hotly competitive auto market. Instead, it is making communications technology a cornerstone of its effort to lure wayward domestic buyers back into American cars — Fords, that is.

The Dearborn, Mich.-based manufacturer's founders would be floored by the company's well-greased, multimedia communications network that now links

☞ Continued on **page 39**

NETWORK LINE

News

Viewdata has canceled its Viewtron videotex project after sinking $50 million into the ill-fated venture. Page 2.

▼

The U.S. House of Representatives is considering a bill that would protect the privacy of electronic mail users. Page 2.

▼

Tandem and Sperry announced IBM-compatible LU 6.2 and Disoss products, respectively. Page 4.

▼

IBM and several international standards groups check out the X.400 message-handling protocol. Page 4.

▼

The 14th annual Interface Conference kicks off in Atlanta today. Page 6.

▼

Features

Confused by network support services? New research sorts out the best in support offerings. Page 26.

▼

NBC News is scooping the competition with cutting edge communications. Page 35.

NEWSPAPER

▶ DEATH KNELL?

Viewtron cashiered; cost: $50M

BY BOB WALLACE
Senior Writer

MIAMI — Knight-Ridder Newspapers, Inc. last week terminated the nation's first commercial videotex service after sinking roughly $50 million into the ill-fated venture.

The action, coupled with Times-Mirror Corp.'s elimination of its Gateway videotex offering just three weeks ago, may have seriously injured the home videotex market. Videotex use in the business market could also be slowed if the failure of the two major efforts casts a pall over videotex technology in general. IBM, Digital Equipment Corp. and Honeywell, Inc. all offer videotex systems designed for business applications.

Viewdata Corp., a wholly owned subsidiary of Knight-Ridder, laid off 79 of its 139 employees last Friday. A source at Knight-Ridder estimated the venture cost the company roughly $50 million since Viewdata's Viewtron service was launched in October 1983.

The Los Angeles-based Times-Mirror ended its Gateway videotex service after reportedly losing between $20 million and $30 million. Both companies relied on subscriber fees and advertising for revenue.

The videotex offerings allowed subscribers to send and receive text and graphics through a personal computer or a keyboard and decoder unit attached to a television set. Users could access electronic mail and news services as well as make shopping and banking transactions from their homes.

The Viewdata venture initially targeted residents in several southern Florida communities. Subscribers were required to purchase an AT&T Information Systems Sceptre terminal at a cost of $600. In addition to the cost of the Sceptre terminal, early subscribers paid a $12 monthly fee and a $1 hourly usage fee.

Mary Crowsen, a spokeswoman for Knight-Ridder, said the cost of the Sceptre terminal, coupled with the proliferation of personal computers, spelled trouble for Viewtron. "Not many people were buying the $600 terminals," she explained. "We changed course and began to lease the Sceptre terminals for $24.95 a month, keeping the dollar-an-hour usage fee. Then we realized that personal computer

Continued on **page 43**

▶ LEGISLATION

House panel slated to mull email privacy bill

BY KARYL SCOTT
Washington Correspondent

WASHINGTON, D.C. — The Electronic Communications Privacy Act is expected to clear one more hurdle this week in its move toward enactment.

The bill, which gives legal protection to electronic mail users, is scheduled to go before the House Subcommittee on Courts, Civil Liberties and the Administration of Justice on Tuesday. Electronic mail users and vendors who support the bill are hoping it will win congressional approval later in the year. .

If passed, the legislation would provide legal protection for electronic mail, satellite transmission and cellular radio communications. The bill would make the interception of electronic messages unlawful whether the information was in transmission or stored in a computer.

The proposed legislation would also establish procedures that law enforcement officials must

Continued on **page 43**

▶ EDITORIAL

Welcome to *Network World*

Welcome to the first issue of *Network World*, the weekly newspaper for communications users.

The tag line underneath the logo on page one reads, "The weekly for leading users of communications products & services." The key word there is *users*.

Network World's mandate is to be an advocate of the user: the communications manager.

We recognize that communications manager is a title that means different things in different companies.

No matter who plays the role, the job is basically the same: coordinating the increasingly complex world of data and voice communications.

With that in mind, we have designed *Network World* to address the job function, no matter what the job title.

To that effect, one of our five regular sections is entitled "Communications Manager." It features columns by staff writers and users that discuss situations you encounter on a daily basis.

Our "Industry Update" section keeps you abreast of what the important companies and individuals within those companies are up to. It also features a "Vendor View" column, written from the vendor perspective, a perspective communications managers frequently encounter.

"Data Delivery" features news and staff and outside contributor columns as well as product announcements on data communications products such as modems, multiplexers, network processors, network management control systems and others.

"Telecom Trends" covers the transmission area of communications, from local-area networks, private branch exchanges, central office switches and key sets to long-haul communications networks and services.

In view of the recent explosion of manufacturing networking, our fifth section is dedicated to "Factory Communications." The Manufacturing Automation Protocol has spawned a new generation of compatible computer communications that will impact communications managers in factory environments everywhere.

Our substantial features section provides you with a host of personality profiles, application stories, special sections, product focuses, technology and trend analyses, vendor profiles and maybe even an occasional fiction piece dealing with a nonfictitious topic.

Table of contents

TOP NEWS

IBM Vtam users face incompatibility snag. **page 1**

AT&T moves to offer Vsat networking. **page 1**

Users are pushing vendors for LU 6.2 support. **page 1**

Ford enlists communications in car wars. **page 1**

News summary. **page 1**

Viewdata's home videotex service is dead. **page 2**

Congress eyeing E-mail privacy bill. **page 2**

Welcome to *Network World*. **page 2**

Tandem and Sperry bolster IBM links. **page 4**

IBM and standards groups talk X.400. **page 4**

A preview of Interface '86. **page 6**

Northern Tel unwraps PC in office mart move. **page 6**

Whither ISDN? Speakers focus on future. **page 6**

INDUSTRY UPDATE

CO switches don role of net hubs. **page 9**

Pathway Design trims work force. **page 9**

TELECOM TRENDS

AT&T bypass pact biggest to date. **page 11**

DATA DELIVERY

Conversant first user speaks. **page 13**

FACTORY COMMUNICATIONS

Endicott, N.Y.: The center of IBM's MAP. **page 15**

COMMUNICATIONS MANAGER

Beaming knowledge via satellite college. **page 19**

OPINIONS

Unearthing the hidden cable asset. **page 22**

Pro & Con: Is voice/data pair a natural? **page 22**

Wielding the information weapon. **page 23**

FEATURES

Unraveling network support options. **page 26**

Evolution of the communications manager. **page 31**

How to be a real communications manager. **page 33**

The networking of NBC. **page 35**

Calendar. **page 44**

Who's Responsible?

...For the loss of your financial data? Market strategy plans? Personnel records? It could be a hacker, a disgruntled or former employee, a competitor.

This year, an estimated $3 billion of sensitive corporate information will be lost through computer crime.

Who's Accountable?

...Your DP/MIS manager? Data communications planner? Security administrator? Has your company ignored the advice of its auditors?

Who's Got the Solution?

SecureNet products from Digital Pathways can effectively guard the information in a single PC—or an entire data network. By tightly managing authorized access.

Our Defender II Computer Access Systems provide sophisticated, yet easy to use, port protection.

They can incorporate advanced Encryption products which shield local PC's and transmitted data, plus unique Personal Identifiers that positively verify users before granting computer access.

The leader in host-independent security systems, we offer modular, integrable products and one-vendor, UL & GSA-approved solutions—supported by a knowledgeable team of sales and service personnel.

Now, Who's Going to Tell the Boss?

YES, I want to know more about SecureNet products.

- ☐ Have your local representative contact me.
- ☐ Send me product information.
- ☐ Tell me about your data security seminars

Name _____
Title _____
Company _____
Address _____
City _____ State _____ Zip _____
Phone _____

RETURN THIS COUPON TODAY!
Digital Pathways, Inc. 201 Ravendale Drive, Mountain View, CA 94043

(OC)

DIGITAL PATHWAYS, INC.

Headquarters/West
Mountain View, CA (415) 964-0707
TWX 910-379-5034
Brea, CA (714) 579-1777

Southwest
Irving, TX (214) 252-3342
Houston, TX (713) 977-1767

South
Atlanta, GA (404) 998-6361

Midwest
Oak Brook, IL (312) 932-4848
Dayton, OH (513) 435-3888
Creve Coeur, MO (314) 993-4848

East
Teaneck, NJ (201) 836-3000
Hartford, CT (203) 249-7203
Ellicott City, MD (301) 461-5707

United Kingdom
Hampshire (0256) 470 677

▶ INTEGRATION

Tandem, Sperry unveil IBM links

Vendors strengthen IBM ties.

BY BOB WALLACE
Senior Writer

Tandem Computers, Inc. and Sperry Corp. are strengthening their ties to the IBM world.

Tandem is today expected to introduce IBM LU 6.2-compatible software that allows its fault-tolerant processors to function in IBM Systems Network Architecture (SNA) networks. Sperry last week announced a set of products that support information exchange between its computers and IBM systems running the Distributed Office Support System (Disoss).

A Tandem spokesman said the company's Snax/APC provides programmers with access to a standard set of program-to-program commands. With Snax/APC, applications on Tandem processors can access software running in an IBM environment.

Frank Gens, an analyst with the Framingham, Mass.-based International Data Corp. said LU 6.2 support allows Tandem systems to function fully in all aspects of an SNA network. "This added functionality is critical because one of (the) Tandem systems' roles is as a subnetwork within an IBM shop — typically a shop where the Tandem system handles heavy transaction processing. LU 6.2 provides Tandem systems with the ability to act as a peer with the highest of nodes in an SNA network, rather than acting as a slave device in a master-slave relationship," he said.

Currently, users attempting program-to-program communication between Tandem systems and IBM hosts have to opt for one of two product — specific communications methods, according to Roger Mathews, SNA product manager for Tandem. Users seeking to initiate a session with an IBM mainframe running the CICS teleprocessing monitor have typically used the IBM system's Full-Function Logical Unit Support scheme. Users trying to link to IBM hosts running IMS used the Secondary Logical Unit Type P method.

Tandem's Snax/APC will be available beginning in July. It will cost $5,000 for an initial license fee, plus a $600 monthly license fee for Tandem Nonstop II and Nonstop TXP systems. For the Nonstop EXT system, the initial license fee is $1,000, plus $240 monthly.

Sperry's Distributed Systems Services (DSS) tools provide library and document distribution services among systems in both Sperry and IBM environments. DSS incorporates IBM's communications architectures, including Document Interchange Architecture, Document Content Architecture, LU 6.2, and SNA Distribution Services.

Sperry DSS products will be implemented on all of its processors. The systems include Series 1100 mainframes, Series 5000 and 7000 departmental computers, Personal Computers and Usernet Systems. The products will be implemented in several phases over the next two years, beginning in mid-year, with releases of DSS products and extensions to Sperry's Distributed Communications Architecture network products. Pricing for the DSS products has not yet been formulated.

Tandem Computers, 19333 Vallco Pkwy., Cupertino, Calif. 95014. Sperry Corp., Information Systems Group, P.O. Box 500. Blue Bell, Pa. 19424.

▶ X.400 ROUNDUP

IBM tests X.400 waters

HANNOVER, West Germany — IBM has taken a cautious first step toward linking its Systems Network Architecture with the upper layers of the International Standards Organization's (ISO) Open Systems Interconnect (OSI) model via the x.400 messaging protocol.

Also on the X.400 front, representatives of Japanese computer manufacturers and European standards organizations met in Monterey, Calif., with the X.400 special interest group of the National Bureau of Standards.

At the Hannover fair here, IBM representatives quietly ushered interested attendees to a small office and demonstrated a link between its Professional Office System (Profs) and networks using X.400 protocols. IBM made it clear that no X.400 product was being announced at the show and termed the demonstration purely experimental.

X.400 is a subset of the seventh layer — the application layer — of the OSI model. Profs is an office system that runs under IBM's VM.

At the fair, an IBM Series 1 minicomputer equipped with an IBM 3279 terminal and Profs was attached to an X.400 network developed by a number of universities, including Queens University of Kingston, Ont.

IBM's European Networking Center in Heidelberg, West Germany, developed the software used to attach the Profs machine to the network. The European Center is responsible for much of Big Blue's OSI research.

A second X.400 network supported products from Britain's ICL, France's Groupe Bull, and Siemens AG and Nixdorf AG of West Germany. The vendors are members of a European OSI promotion group called Spag, which staged a similar demonstration at an office automation trade show in Paris last year. Nixdorf did not participate in that demonstration.

> *"X.400 is a subset of the seventh layer of the OSI model."*

At the fair, a Siemens machine acted as a gateway between the two networks so that equipment from Spag members could send information to Profs.

The link went largely unnoticed because visitors to the small Spag stand saw only ICL, Siemens and Groupe Bull machines interchanging messages. They had to move to another exhibition area in the sprawling Hannover complex to see the IBM and Nixdorf equipment in action.

Although much work has been completed for X.400, there are not yet any commercially available products.

However, a number of vendors have used X.400 to exchange messages on their own networks and predictions are that a number of X.400 products will be announced by the end of this year.

IBM's early move toward X.400 may indicate Big Blue's growing acceptance of OSI. Although IBM has claimed that it intends to support the ISO model, skeptics have said that IBM views OSI as a threat to SNA and will only begrudgingly meld the two architectures.

The Japanese computer manufacturers that met with the National Bureau of Standards (NBS) special interest group on X.400 included Fujitsu Ltd, Mitsubishi, NEC Corp.and Hitachi.

European standards bodies at the meeting included CEN/Cenelec and the European Conference of

Continued on page 43

NETWORK WORLD

Box 9171, 375 Cochituate Road
Framingham, Mass. 01701-9171
617/879-0700

Editor
Bruce Hoard
Managing Editor
John Gallant
Features Editor
Steve Moore
Associate Editors
Kathleen M. Cahill
Lisa Guisbond
Senior Editors
John Dix
Sharon Scully
Senior Writers
Paul Korzeniowski
Margie Semilof
Bob Wallace
Staff Writers
Michael Fahey
Nadine Wandzilak
New Products Editor
Jim Brown
Washington, D.C. Correspondent
Karyl Scott
1273 National Press Building
529 14th Street NW
Washington, D.C. 20045
West Coast Correspondent
Mary Petrosky
1060 Marsh Road
Suite C-200
Menlo Park, CA 94025
Assistant Features Editor
Christine Casatelli
Robert Mitchell
Copy Editors
Josh Gonze
Nicolene Hengen
Beth Lazarus
Susan Tanona
Art Director
Dianne Gronberg
Informational Graphics Designer
Alan Hopkins
Assistant to the Editor
Cheryl Tynan

Publisher
F. Douglas DeCarlo
Administrative Assistant to the Publisher
Mary Fanning

Production Director
Peter Holm
Production Manager
Marlene Stibal
Production Assistant
Stephen DeLacy
Pasteup Manager
Patricia Gaudette
Typesetting Manager
Carol Polack

Board Chairman
Patrick J. McGovern
President
W. Walter Boyd
Executive Vice President
Lee Vidmer
Senior VP-Communication Services
Jack Edmonston
Group VP-Circulation
Margaret Phelan
VP-Finance
William P. Murphy

Second-class postage paid at Framingham, MA, and additional mailing offices. *Network World* (USPS 735-730) is published weekly, except for a single combined issue the last two weeks in December by CW Communications/Inc., 375 Cochituate Road, Box 9171, Framingham, MA 01701-9171.

To apply for a free subscription, complete and sign the qualification card in this issue or write *Network World* at the address below. No subscriptions accepted without complete identification of subscriber's name, job function, company or organization. Based on information supplied, the publisher reserves the right to reject non-qualified requests.

Non-qualified subscribers: $3.00 a copy; U.S. — $65 a year; Canada, Central & South America — $110 a year; Europe — $165 a year, all other countries — $245 a year (airmail service). Four weeks notice is required for change of address. Allow six weeks for new subscription service to begin.

Four weeks notice is required for change of address. Please include mailing label appearing on front cover of the publication.

Network World can be purchased on 35mm microfilm through University Microfilm Int., Periodical Entry Dept., 300 Zebb Road, Ann Arbor, Mich. 48106.

Network World is distributed free of charge in the U.S. and Canada only to qualified management or professionals who specify and maintain communications equipment and systems, including voice, data and video, as well as to common carriers, consultants, systems houses and manufacturers of communications equipment.

PHOTOCOPY RIGHTS: Permission to photocopy for internal or personal use or the internal or personal use of specific clients is granted by CW Communications for libraries and other users registered with the Copyright Clearance Center (CCC), provided that the base fee of $3.00 per copy of the article, plus $.50 per page is paid directly to Copyright Clearance Center, 21 Congress Street, Salem, Mass. 01970.

Permission to photocopy does not extend to contributed articles followed by this symbol. ‡

POSTMASTER: Send Change of Address to *Network World*, Box 1021, Southeastern, Pa. 19398-9979.

Copyright 1986 by CW Communications/Inc. All rights reserved. Reproduction of material appearing in *Network World* is forbidden without written permission. Special requests for reprints and permissions only should be addressed to Nancy M. Shannon, CW Communications/Inc., 375 Cochituate Road, Box 9171, Framingham, Mass. 01701-9171.

ABC BPA ABP

Recently GTE and United Telecommunications Inc. agreed to establish a joint venture which would merge their respective long distance voice and data communications businesses. One result of the proposed joint venture will be the merger of two long-established data communications companies. GTE Telenet and US Telecom—Data Communications (formerly Uninet) will combine to form the data communications business of the new US Sprint Communications Company. The new company hopes to receive the necessary legal and regulatory approvals in time to formally begin operations around July 1st.

Why the joint venture?

Today's telecommunications market is constantly changing. Our proposed joint venture will allow us to offer our customers even more flexibility in taking advantage of these changes. And combining our technology will bring you an even wider range of data communications capabilities to choose from. While the integration of our sales and services operations will increase the level of customer service.

And when the state-of-the-art fiber network now being installed by US Telecom throughout the U.S. is combined with our data capabilities, we'll also be able to bring you closer to the world of voice/data/video integration.

But what about now?

Until the joint venture receives the required approvals, it's still business as usual. After all, we're both still committed to providing you with the same levels of service capability and quality that you've been experiencing all along. So you should continue to deal with each company as you have in the past.

If you have any questions about our new or existing products and services, we'll both be exhibiting at this year's Interface Show in Atlanta in March. Stop by and we'll talk. With the steps we're taking to improve data communications, it'll be worth the walk.

GTE Telenet

US Telecom™
Data Communications Company

We're taking steps to bring you better data communications.

▶ INDUSTRY MEET

Interface XIV underway

Packet-switching, net management tools to shine.

BY MARGIE SEMILOF
Senior Writer

ATLANTA — The estimated 15,000 visitors expected to hit the floor of the Interface '86 conference, which runs today through Thursday, will be greeted by a flood of packet-switching and network-management product announcements.

Tymnet, Inc. said it plans to introduce IBM Systems Network Architecture/Synchronous Data Link Control (SNA/SDLC) support for its asynchronous-to-3270 packet-switched service.

GTE Telenet Communications Corp. also is expected to announce dial-up SDLC, asynchronous-to-IBM 3270 conversion and 2780/3780 support.

Infinet, Inc. plans to announce a family of T-1, X.25, full-duplex dial products, and Avant Garde Computing, Inc. will introduce a network control workstation.

Industry analysts said announcements of packet-switching products that interface with both public and private networks signal a maturation of that market. Francis Dzubeck, president of the Washington, D.C.-based consulting firm Communications Network Architects, added that a combination of tariff stabilization and vendor competition has driven down the cost of packet-switching devices.

"Packet switches are changing from the expensive tree-structured network to a mesh-structured packet network," Dzubeck said. "It's easier to cost-analyze and redesign your network around the new standard X.25 packet structures."

Charles Robbins, president of Strategic Marketing Trends, a Sharon, Mass.-based market research firm, said attendees can also expect to see V.32 full-duplex modems with 9.6K bit/sec capability from such vendors as Codex Corp.

"Acceptance of those modems is being driven by people who want to run higher speeds on analog," Robbins said. "They are not making the transition to digital in all cases."

Robbins also predicted that international standards for modems operating at 14.4K bit/sec will be a hot topic on the conference floor.

Analysts predict that a number of vendors will engage in so-called "conceptual selling." One demonstration of such selling may be in evidence at the AT&T Communications booth. A spokesman for AT&T said that the vendor has no plans to release any new products, but is expected to show off integrated services digital network capabilities that users can purchase from AT&T.

Announcements of company consolidations and joint development efforts may also be in store. Certain exhibition booths may be located in close proximity to each other so vendors can refer customers to their project partners.

Although most major companies are slated to exhibit at Interface, there will be at least two significant no-shows — Digital Equipment Corp. and Wang Laboratories, Inc. Both companies will be represented by speakers at Interface. But conflicting show dates have forced DEC to choose between the Atlanta show and the Office Automation Conference (OAC) being held simultaneously in Houston. A spokeswoman for DEC said the company decided to exibit at OAC simply because DEC has customarily attended the show.

Wang's absence is a surprise because of the company's increasing interest in communications markets.

"It has been a big year for reassessing product lines," Robbins remarked. "I suspect that is what Wang is doing."

▶ OFFICE AUTOMATION

Northern Tel micros extend Meridian voice/data line

BY JOHN DIX
Senior Editor

In a bid to broaden its product line, Northern Telecom, Inc. last week unveiled two new personal computers in the U.S. as extensions of its Meridian line of voice/data systems.

The Meridian 6000 workstations include the M6210, a stand-alone Microsoft Corp. Xenix-based system that supports up to six users and runs many of the same applications as Northern Telecom's Meridian DV-1; and the M6110, a single-user device compatible with the IBM Personal Computer AT, that can be integrated with the DV-1.

Both processors have been marketed in Europe for the past year under the Vienna product label.

After the failure of its first office automation initiative — which it mounted in 1978 with the acquisition of terminal makers Data 100 Corp. and Sycor, Inc.— Northern Telecom's new foray signals an attempt by the company to expand into the office through its family of switching products, analysts concur.

"Northern Telecom isn't going into the stand-alone PC business," said Ian Angus, president of Angus Telemanagement Group, Inc. in Toronto. "It is still in the communications business and presents itself that way."

As announced, the M6210 multiuser workstation cannot communicate with the DV-1, a departmental or small office system that integrates voice switching with data processing capabilities.

Northern Telecom claims the M6210 can support many of the same applications as the DV-1. The M6210, however, is based on the Xenix operating system and the DV-1 uses a Northern Telecom mod-

Continued on **page 43**

▶ CONFERENCE

ISDN ideas

Vendors: look toward bottom line.

BY MARY PETROSKY
West Coast Correspondent

Communications vendors must relate the benefits of integrated services digital network (ISDN) to a company's bottom line if they hope to stir user interest in the emerging technology. That was the message of speakers at last week's Dataquest, Inc. 1986 Telecommunications Industry conference.

Telecommunications vendors see ISDN as a way to expand their markets while giving users more services and greater flexibility in configuring networks.

Users today, however, are more interested in leveraging existing communications and computer equipment than in buying new technology, according to Robert Grant, director of sales at Mountain Bell, a US West company.

A number of key user companies aren't even interested in participating in ISDN trials, Grant said. Several corporations targeted for a Mountain Bell trial, slated to begin next fall in Phoenix, declined to participate.

More recently, however, a number of customers expressed interest in the technology, and one major company planning to open a regional office in Denver specifically requested ISDN capabilities, Grant said.

Although potential customers may not understand the technology, a growing number see ISDN as a way to gain a competitive business advantage, he added.

Another issue raised at the conference was pricing of ISDN products and services. Potential ISDN users should look for more functionality, but not lower prices for their telecommunications dollar, declared James Hahn, president and chief executive officer of Infotron Systems Corp.

Many potential customers think ISDN is a product, when it should be viewed as a standardized communications environment, according to Eugene Lotochinski, vice-president for market development at Northern Telecom, Inc.

Initial ISDN service offerings will probably be equivalent to existing services, and vendors are going to have to implement ISDN on top of current products in order to protect their customers' investments in equipment, Lotochinski explained.

Despite several speakers' attempts to focus on user applications of ISDN, standards issues dominated conference presentations.

Vendor preoccupation with standards reflects the amount of work that remains to be accomplished before ISDN products and services become available, according to Wil Felling, vice-president and director of Dataquest's Telecommunications Group.

Dataquest predicts ISDN products will be available on a limited basis in 1988. These will include central office-switching equipment and an interface to digital private branch exchanges. One of the first concrete product changes end users are likely to see are telephones with digital displays.

Semiconductor manufacturers are already developing chips for ISDN products. Thomas Innes, general manager of telecommunications operations for Intel Corp., said his firm will have chips for developing a relatively simple ISDN terminal adapter by the middle of the year.

LU 6.2 from **page 1**

as a network operating system because it manages access to and contention for network devices.

While significant within IBM's realm, the overwhelming importance of LU 6.2 is the fact that it is becoming a de facto standard, according to Eduardo Stecher, vice-president of marketing for Software Research Corp. Software Research is a Natick, Mass.-based consulting company that also sells information delivery products to user and vendor companies.

"A company the size of ours could never select a single vendor," Compton said.

"It's not a good strategy. We put together an architecture and said to vendors, 'if you support this series of fairly rigidly defined interfaces, then we'll buy your equipment. If you don't, we won't.' At the office-server level we said, 'you must support LU 6.2.'

"LU 6.2 is the best way to network departmental computers, because the critical thing was to make the integration burden the vendor's problem," Compton continued.

GE, which is not a large-scale SNA shop, has equipment from a variety of vendors, including Wang Laboratories, Inc., Data General Corp., Hewlett-Packard Co. and Digital Equipment Corp. "All of our major vendors have announced their intention to support LU 6.2," Compton said.

Distributed processing

While interested in the multivendor implications of LU 6.2, at this point United is primarily interested in LU 6.2 for its distributed processing capabilities.

"LU 6.2 is a vital communications product for peer-to-peer, high-integrity data transport," according to Mike Nearman, who is the manager of technical support for distributed processing at United.

"We want to begin to separate logic into multiple processors and have widespread peer-to-peer communications between various computer systems. LU 6.2 is the best method of doing that."

Like many companies, United's terminal network — some 50,000 devices strong — grew up around one central site. "We have a very large terminal network that is growing rapidly and large central site systems that are growing rapidly.

"If we don't distribute, we are going to have problems, as will others in the industry," Nearman said. "LU 6.2 is a critical cog in deploying distributed systems, running business function logic in multiple processors and allowing the processors to exchange information."

The benefits LU 6.2 brings to the multivendor environment are an added boon. United does not specify LU 6.2 as a procurement standard "because we don't know too many vendors that can meet it," Nearman said.

United is, however, a "heavy proponent of other vendors supporting LU 6.2," he added.

LU 6.2 also plays heavily in the plans of Bankamerica in San Francisco, although it has not worked it into its procurement process, according to Mario Markof, systems manager in the world banking division.

Markof, who said his opinions did not necessarily represent the views of the bank or its management, said LU 6.2 would be seen as the vehicle of choice for Bankamerica's Global Communications Network.

For all of its benefits, LU 6.2 is not a panacea. It does not, for example, compensate for file or data structures within different machines. That concern is addressed at a higher network architecture level.

"LU 6.2 gives you a good, solid basic communications capability," GE's Compton explained. "But it doesn't solve all of your problems by a long shot. All it means is that you don't have to write nasty communications software. And that's very useful."

BUILD BETTER CONNECTIONS

The Challenge

Integrate resources from multiple local and remote offices into one easily managed system.

Increase productivity by giving your users access to the computing resources they need to do their jobs better.

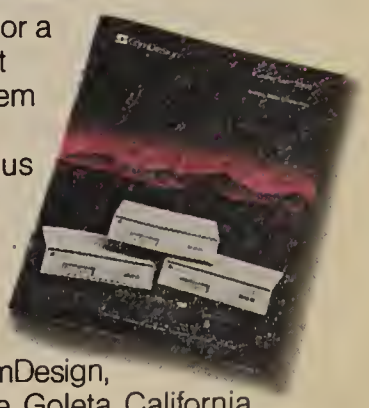
Defer purchasing additional processing power and peripheral equipment by enabling multiple users to share the same resources and applications.

Expand and reconfigure your system whenever necessary without sacrificing your original investment.

The Solution

FutureCom™ 2000 manages interactive data connections between any number of computers, PCs and terminal equipment. With FutureCom, a connection may be established between any two devices anywhere in the network on demand. Incompatible equipment and processes may share the same network and be available to the same users.

Begin with just a few nodes or a few hundred. And, you can get started with a FutureCom system for as little as $10,000.



Find out how easy it is—call us now for your copy of "Building Better Connections." Call (800) 235-6935 in the continental US, or (800) 368-8092 in California. Elsewhere, call (805) 964-9852. Or write to ComDesign, Inc. 751 South Kellogg Avenue, Goleta, California 93117-0880. Telex WUI/MCI 650-271-1733.

ComDesign

Leaders in Data Communications

See Us at Interface '86 Booth #1250

Vtam from **page 1**
its network until a solution is found. Shearson/American Express, Inc. in Phoenix has wrestled with the inconsistency for 18 months.

This incompatibility stems from IBM's attempt to expand SNA addressing capabilities. When SNA was introduced 11 years ago, it supported up to 64 hosts and 64,000 logical units. Now, big users are running out of addressing space.

To alleviate the situation, IBM introduced new addressing schemes. Vtam Versions 2.2 and 3.1 included a feature called Extended Network Addressing (ENA), which supported up to 256 hosts and 8 million logical units. Many users, including Eastern Airlines, Inc., American Airlines and First Chicago Corp., have begun migrating to ENA without problems.

But problems arise when a company tries to use ENA with TPF. TPF, used by large financial service organizations and airlines, is designed for high-volume transaction processing.

The problems are centered on Format Identifications (FID), which route data to devices on a network. With ENA, IBM changed the FID length. ENA works with 48-bit units called FID4s. Previous releases of Vtam had incorporated 16-bit units, dubbed FID1s.

TPF works only with FID1s, which are incompatible with FID4s. American Express and the California bank did not recognize the inconsistency until they had committed to ENA.

American Express has routed data to a front-end processor and an IBM 3081 mainframe that translate the FID formats. The translation process has been in test mode for four months and the company plans to move the application to its production network soon.

But the conversion application will only run on mainframes as powerful as the IBM 4381. The processing power and software needed to convert the FID formats translates into a multimillion dollar investment. Also, since data must be routed through additional machines, problem determination and resolution becomes more difficult. Finally, the conversion process slows network response time.

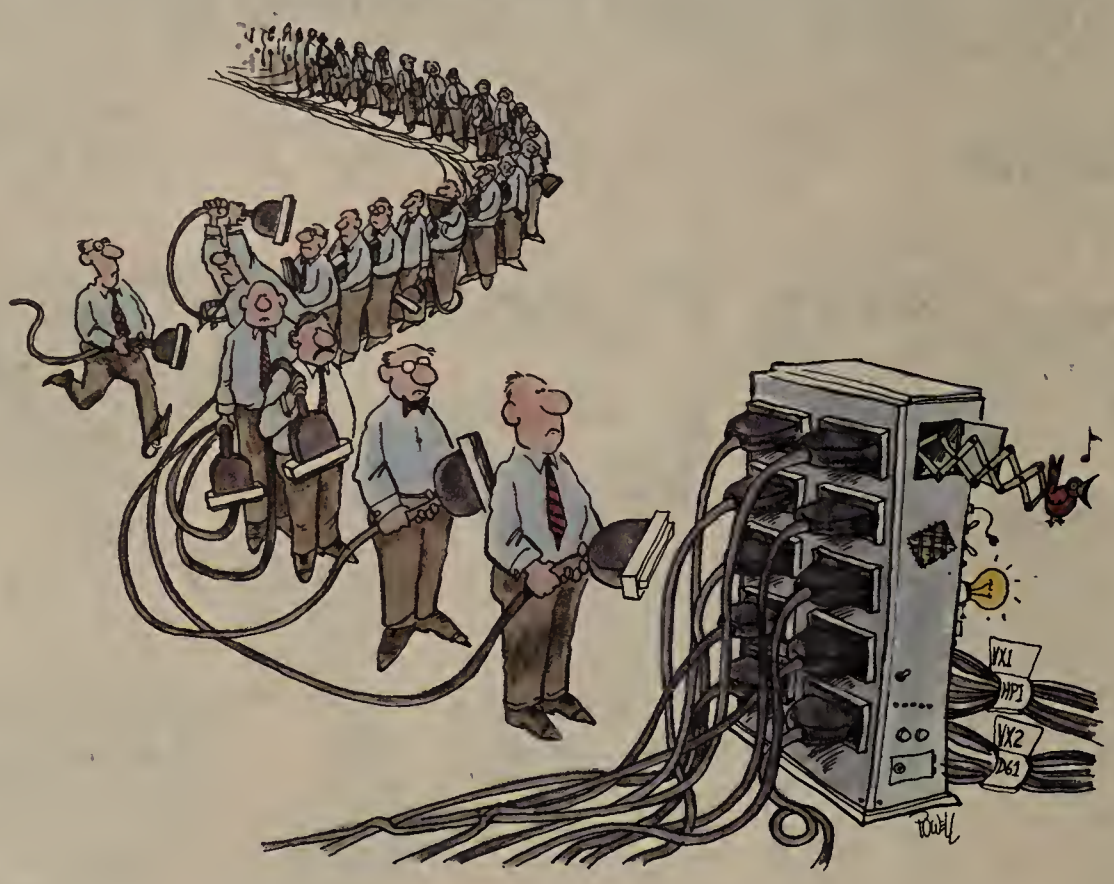
USAir, Inc. and Bankamerica Corp. recognized the ENA and TPF incompatibility and opted for a second SNA enhancement to circumvent SNA addressing limitations. They chose an SNA-to-SNA gateway, Systems Network Interconnection (SNI), to expand their networks.

The SNI gateway does not supply a full picture of network operations. Problem determination and resolution can be difficult. American Express has been working with SNI but would prefer ENA.

SNI does not support automatic session restoral, a feature used when connection between a host and a logical unit is broken. When the connection is reestablished, the feature automatically connects a device to the application it was using. For example, an automated teller machine (ATM) will be tied to the host application that controls the bank's ATMs.

Without automatic session recovery, a network operator must recognize the link is broken and restore it. In a large ATM network, the manual restoral process is very tedious. Even more important, if the logical unit resides on one side of the gateway and the application is controlled by the other, the operator may never be notified that the link has been broken.

The California bank found this limitation so stringent that it is also attempting to solve ENA and TPF inconsistencies rather than incorporate SNI. Rumors have been circulating that IBM will soon announce a new release of TPF. Communications managers think the release will solve ENA compatibility problems. Others say a solution may be 18 months away.



Are Your Business Connections Out Of Control?

Switch To Sequel.

Now there's an affordable alternative to the patch panel.

Enter Sequel's Distributed Data Switch.

Ours is the first intelligent small data switch offering you all large switch features and more... for the price of a patch panel.

Connect as few as six or as many as 192 ports to all your terminals, I/O ports, modems, or any device that sends or receives data up to 19.2K bits per second. Without line drivers or short-haul multiplexers.

The Distributed Data Switch is designed to grow with your business.

You can even split our switch in half... with each half connected via two twisted pairs of wires up to a mile and a half away.

Yet our switch costs less than any other. The low $100-per-port price begins at 30 ports, instead of the usual 300.

Here's how to find out on your own PC:
Call us today and we'll send you a demonstration floppy that will show you how Sequel's Distributed Data Switch can put your network back in your control. And why Sequel means, "We're What's Next."

Standard Sampling Features
- port contention by name, number, or class
- help menu
- simultaneous toggling
- priority queing
- auto baud
- network status display
- password-controlled protection
- prompts in any language
- time-of-day reconfiguration

Options
- security call-back
- redundant power
- redundant logic

SEQUEL

Sequel Data Communications, Inc.
975 Walnut Street / P.O. Box 4069
Cary, NC 27511
919-469-9510 Telex 5106002826

INDUSTRY UPDATE

"The most lucrative markets in which to sell PBXs over the next five years are found on the West Coast. The Pacific Coast states offer 20% of the opportunities as defined by PBX density within major population areas. Following closely are the central states, which promise 18% of the opportunities, then the southern states at 16%.

From **PBX: New Environment**
by the Eastern Management Group

▶ CENTRAL OFFICE

CO is on the go

Central office switches hit private networks.

BY BOB WALLACE
Senior Writer

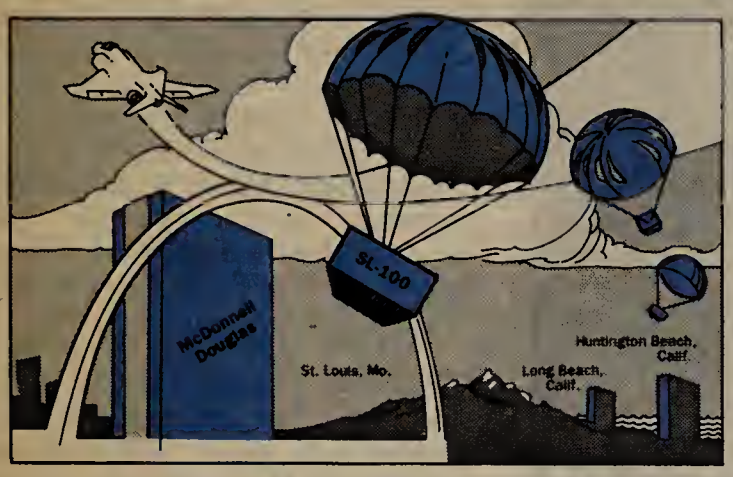
A central office switch's place is no longer in the central office. Large corporate network operators are using the huge switches as network hubs that tie numerous remote private branch exchanges to the corporate headquarters. Rapid growth in the size of corporate nets has made the use of central office switches a necessity.

In several of these cases, installing multiple PBXs was not an option. More was not better. Purchasing central office switches was the only choice.

James McAllister, corporate telecommunications director for Tymnet/McDonnell Douglas Network Systems, Inc. said a trio of Northern Telecom, Inc. SL-100s

Continued on **page 10**

McDonnell Douglas scraps PBX plan for central office switches



SOURCE: TYMNET/MCDONNELL DOUGLAS NETWORK SYSTEMS, INC.

▶ MICRO-MAINFRAME

Pathway idles 10

BY MARGIE SEMILOF
Senior Writer

NATICK, Mass. — Pathway Design, Inc., a manufacturer of micro-computer-to-mainframe communications products, said its recent decision to lay off more than one-sixth of its workforce was an effort to streamline its operations. But industry observers say the move may have been prompted by sluggish sales in the fledgling micro-to-mainframe link industry.

Pathway Design produces a link that ties IBM micros and mainframes and a gateway product that links mainframes and local-area networks.

The company terminated 10 of

Continued on **page 10**

CONTRACTS

SUNNYVALE, Calif. — **California Microwave, Inc.** announced that its subsidiary, **Satellite Transmission Systems, Inc.,** has been selected by **AT&T Communications** to provide **International Business Services** with earth stations. The earth stations are to be installed in the continental U.S. in contracts valued at more than $3 million.

MARLBOROUGH, Mass. — **Concord Data Systems, Inc.** announced an OEM order agreement with **Infinet, Inc.** of North Andover, Mass., for Concord's Model 224 2,400 bit/sec, dial-line, full-duplex modems that will value in excess of $2 million throughout the next two years.

WASHINGTON, D.C. — The **U.S. General Services Administration (GSA)** recently awarded contracts to **US West Information Systems** to replace station equipment and small private branch exchanges in four GSA geographic regions. Total maximum contract value is $105.5 million.

NASHVILLE, Tenn. — **Northern Telecom, Inc.** and **Commonwealth Telephone Enterprises' Telephone Group,** the nation's 13th largest non-Bell telephone company, have signed a three-year agreement for the purchase of $18 million worth of Northern Telecom's DMS digital switching line.

VENDOR VIEW

BY MARK DAVIES

New times bring new traumas

The data communications industry is on the threshold of an exciting new era. It is an era in which businesses fully realize the strategic importance of their network investments and, as a result, demand more from that investment.

It is an era of the sophisticated end user — pushing for new technologies and applications to meet comprehensive communications needs. It is an era in which emerging standards drive product development — providing end users with the freedom to choose among vendors and technologies.

Clearly, those vendors who effectively meet the needs of today's users will be the survivors of the inevitable shakeout.

A wide range of new service offerings is already or soon will be available. Packet switching is now cost-effective in the U.S. The cost of satellite services is affordable. New digital services are being added that will eventually lead to integrated services digital networks.

There will be an abundance of available bandwidth between the nation's 20 largest cities, making it attractive to combine voice and data transmission. Favorable tariffs will support communications growth, and private networks will continue to spring up because of attractive bulk tariffs.

Users are faced with combining numerous technologies, including private microwave, satellite, bypass, cellular radio, cable television broadband and fiber optics. This calls for a diverse set of media interfaces at the customer premises.

The result of these new technologies is a whole new set of user requirements. Users continue to demand the freedom to choose vendors and technologies.

They want the network to have multiple capabilities, including data, voice and video. They want to have the flexibility to configure their own networks. Above all, users want a network that is going to be continually up and running and reliable.

Vendors must provide ways for users to exchange critical information across dissimilar services and dissimilar architectures. Internetworking between local-area networks and wide-area networks is a paramount requirement.

Transmission products that interface to all media types in the digital and analog worlds will be required. These products must also have the ability to handle various protocols, along with providing switching and routing functions among diverse networks.

The most critical element to integration, however, is network management. In this complex environment, a single point of control is essential. The user is ultimately responsible for the performance of the network.

The evolution of standards is essential in making this happen. Emerging standards for open architectures, such as the International Standards Organization's Open Systems Interconnect model, and for carrier interfaces, such as ISDN, are driving the creation of products that are capable of meeting these requirements.

Certainly, this is the beginning of a new era of communications. An age of excitement. An age of challenge. An age of change.

Davies is vice-president of marketing with Codex Corp., Mansfield, Mass.

Pathway from **page 9**
its 58 employees, including Marketing Director Grace Zimmerman and Director of Engineering Sumner Blount.

Scott Smith, an analyst with the Stamford, Conn.-based Gartner Group, Inc., said that slow micro-to-mainframe link sales were likely the biggest contributor to the layoffs. "Micro-to-mainframe link support requirements were more than people expected," he said. "The sales cycles also took longer than first thought. That's putting pressure on everyone in the business."

The company declined to release year-to-date financial information but reported that its fiscal 1986 performance fell short of projections.

CO Switch from **page 9**
had already been installed in the company's corporate net. One unit is located at company headquarters in St. Louis, Mo., and handles 32,000 station lines. McAllister said a request for proposal for a second SL-100 for the company's headquarters has already been issued. An SL-100 at the Long Beach, Calif., facility supports 10,000 stations, and a third at the company's Huntington Beach, Calif., location handles 8,000 lines.

"Many vendors are pushing the idea of using an array of small switches, which would be a nightmare to handle in our environment," McAllister explained. More than 30 smaller PBXs help link the system's 62,000 users at 120 different locations to the corporate network, he said.

"We had a complex problem here," McAllister claimed. "We have a lot of buildings, people moving back and forth and new groups forming. We wanted an environment where we wouldn't have to keep changing people's phone numbers or balancing tie lines."

The decision to implement central office switches into the corporate net was made in mid-1983. McAllister said he would like to have most of the company's 30 smaller PBXs be Northern Telecom SL-1s so Tymnet could use Northern Telecom's Electronic Switched Network (ESN), a proprietary switching scheme, to tie the Northern Telecom products together.

With ESN, McDonnell Douglas could pass data, as well as digitized voice, between the digital switches without analog-to-digital conversions. McAllister's advice to those considering following the same corporate networking path: "Don't be the first. Pioneers get arrows in their backs."

The University of Michigan at Ann Arbor is one of several academic institutions implementing, or planning to implement, central office switches in their communications' network. Others include MIT in Cambridge, Mass., and Cornell University in Ithaca, N.Y.

Sam Plice, telecommunications and administrative systems director for the University of Michigan's Ann Arbor campus, is overseeing the installation of a multicampus communications network that features a Northern Telecom SL-100 central office switch.

The system, which will handle mostly voice traffic at the outset, will support roughly 30,000 users located at the school's Ann Arbor, Flint and Dearborn campuses. The SL-100 switch will be used in a distributed application with either a Northern Telecom Remote Line Concentrating Module or a Remote Switching Console located at each of 12 remote locations.

Microwave linked switches

Switch units at the Flint and Dearborn campuses will be linked to the SL-100 via microwave. All other remote sites will be connected to the switch via single mode fiber-optic cable. The university uses a packet-switched network to handle asynchronous data traffic at speeds up to 19.2K bit/sec.

Plice said there are two main problems with installing multiple PBXs in an environment like the University of Michigan.

"The principal problem is that you would lose some calling features because users would be forced to call between multiple switches," he explained.

"Secondly, with a single switch, you have a single data base. With three switches, you would have three data bases. Beyond three switches, your network engineering becomes complex, as linkages between switches must be carefully engineered."

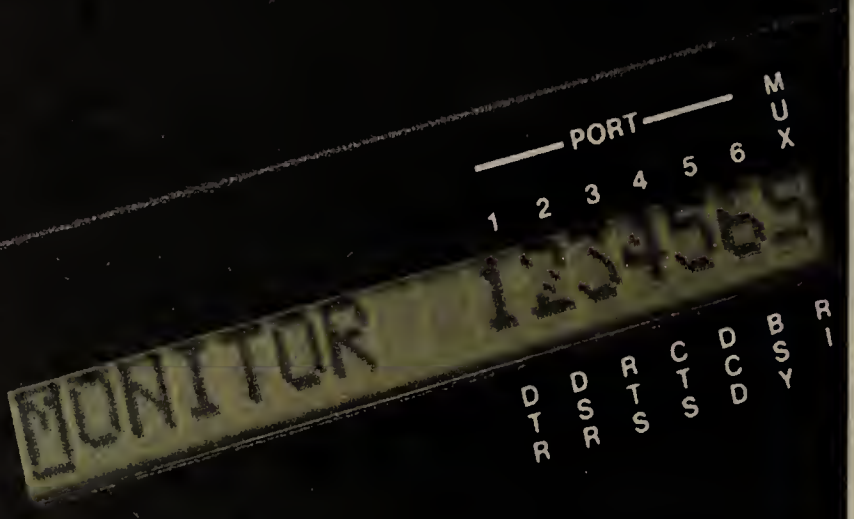
The multiple PBX approach also uses a lot of switching capacity, since the switches must route all traffic around the network, Plice said. "If you go beyond three switches, you're really in trouble," he declared.

Plice advised those considering using a central office switch as a net hub to do a great deal of careful planning before implementation to avoid grief in the equipment installation stages.

"In our situation, we are rewiring an entire campus. We have trenches dug all over campus and are basically disrupting everybody's life," he lamented.

The university's 1.2-million-square-foot hospital has already been connected to the SL-100. Plice claimed all campuses would be connected to the switch by the end of the year.

A display of power.



astrocom

The ATDM from Astrocom can multiplex data from up to six synchronous devices on to a single DDS 56K transmission link, CCITT equivalent 64K trahsmission link, or either of these speeds on private 4-wire 56K or 64K bps lines. It divides the bandwidth among its six channels in any combination of speeds from 2.4 to 19.2K bps.

ATDM set up and operation is extremely simple. The unique LCD command display lets you easily set port speeds, monitor system status and perform network diagnostics — no DIP switches to set. Parameters are downline loaded to remote units. Other features include:

- Eight user selectable speed formats
- Non-volatile RAM storage of parameters
- EIA signal propagation for tail circuits
- Local and remote loopback tests on a per channel basis
- Tabletop or rack-mount packaging
- Available with built-in DSU/CSU or short haul modem
- DSU/CSU, short haul option provides bit error rate display
- 220V/50 Hz available

And, at a price of $1,395, you get a lot of power for the dollar. For more information call us at (612) 227-8651. It's time to make your power move!

astrocom

Delivering solutions in data communications.

120 W. Plato Blvd.,
St. Paul, MN 55107
(612) 227-8651, Telex 297421

TELECOM TRENDS

News flash

IBM is right on schedule with the delivery of its Token Ring Network, which became commercially available last Tuesday. The IBM Token Ring Network/IBM PC Network Interconnect program and the Advance Program to Program Communications program for the IBM Personal Computer are also now available, months earlier than IBM originally promised. Customer and dealer orders are currently being filled, an IBM spokeswoman said.

▶ ANALYSIS

AT&T in big glass bypass

N.Y. Telephone is the unlucky loser in another big bypass deal.

BY JOHN DIX
Senior Editor

In the largest bypass deal consummated to date, AT&T Communications, Inc. recently signed a contract to lease capacity on a New York fiber-optic network that it will use to sidestep New York Telephone Co.

The bypass contract calls for AT&T to lease the equivalent of 750 T-1 (1.54M bit/sec) circuits from Teleport Communication, a joint venture 95% owned by Merrill Lynch & Co. and 5% owned by Western Union Corp. The contract expands upon a deal reached last year in which AT&T agreed to support Merrill Lynch using 120 Teleport T-1s.

Besides enabling AT&T to stabilize costs and reduce the access fees it pays to New York Telephone, the bypass deal indicates that AT&T is counting on large customers to migrate to the T-1 digital communications facilities.

AT&T has long proclaimed it would not bypass local telephone companies unless they were

Continued on **page 12**

Users rate their PBXs

	ITT Corp.	NEC Telephones, Inc.	GTE Communication Systems Corp.	Northern Telecom, Inc.	Rolm Corp.	AT&T Information Systems
Ease of installation	C+	B	B+	A–	B–	B
Ease of making changes	C–	B–	C	B	B	B–
User friendliness	C	B+	C–	B–	B–	B–
Expandability	D	B	C+	A–	B	C+
Features	C–	B	C+	A–	A–	B
Overall performance	C+	B	C+	A–	B+	B
Price competitiveness	D	B–	C+	A	C+	C+
Reliability	C	B+	B	B+	B+	A–
Technology	C–	B	C–	B+	B+	C+
Total score	**C**	**B**	**C+**	**B+**	**B**	**B–**

Short of making the dean's list, Northern Telecom still came out with the highest grades in a recent user survey.

SOURCE: THE MARKET INFORMATION CENTER, INC.

CROSSTALK
BY JOHN DIX

A chorus of crybabies

It's hard to figure out who to believe when listening to lawyers from the major long-distance communications carriers argue the plight of their respective companies.

They're all crying foul.

A recent trade show pitted lawyers against each other from AT&T Communications, Inc., GTE Sprint Communications Corp. and U.S. Telecom, Inc. The final speech was given by a representative from the Federal Communications Commission.

John D. Zeglis, vice-president and general counsel for AT&T Communications, argued, as could be expected, that AT&T is suffering under the onslaught of competition. In its continuing effort to win regulatory freedom, AT&T paints a picture of itself as Gulliver, a benign giant unjustly tied down by regulations and pestered by Lilliputian competitors.

Zeglis said equal access balloting, customer allocation and retroactive allocation are all taking their toll. Balloting is the equal access process of asking customers to pick a primary long-distance carrier. Customers who don't choose a carrier are allocated to the competing carriers on a prorated basis. Retroactive allocation is being done in areas where the balloting has long been complete.

The highly publicized misassignment of customers to AT&T — a recent event that has been portrayed as a covert ploy to retain subscribers — was the result of a computer error that involved only 5,000 customers, Zeglis said. More than 80 million customers have been processed correctly, he added.

In his closing remarks, Zeglis tried to make the other carriers out as simply greedy. "Trunkside connections, '1+ dialing' and other concerns were desired by the other common carriers in the decade of antitrust," Zeglis said. "They have that through equal access. Now they want more."

To be fair to the monolith, the two other carriers present, GTE Sprint and US Telecom, had more than a vested interest in ganging up on AT&T because of their plans to merge. The company lawyers, however, presented their cases independently.

A.K. Wnorowski, vice-president and general counsel for GTE Sprint, dismissed AT&T's claim that the long-distance market is now competitive. AT&T controlled 90% of the interexchange market when it was divested in January 1984, he said, and still controls an overwhelming share. By way of comparision, the dominant airline company had a 14% market share when that industry was deregulated.

Besides market share, the other common carriers are at a severe disadvantage competing against AT&T due to lack of customer data, according to Wnorowski. Lack of accurate customer histories and traffic data cost GTE Sprint $16 million through November 1985 in squandered construction costs, he said. "We overbuilt to serve some areas because we didn't have valid customer usage data," Wnorowski said.

Time is a critical foe in the battle against AT&T, according to John R. Hoffman, senior vice-president for legal and external affairs for U.S. Telecom. He says equal access hasn't borne fruit. "We're having problems with equal access provisioning

Continued on **page 12**

BOC BRIEFS

Bell South Corp. and **Ameritech** operating companies recently won regulatory approval to provide packet switching services. **Ohio Bell** will be the first **Ameritech** company to offer packet switching. The service will be available in Cleveland, Columbus, Dayton, Toledo and Akron, Ohio. **Bell South Corp.** will offer X.25 and X.75 services in Florida and Georgia. It will link its Pulselink Public Packet-Switching Network Service to national packet nets through X.75 gateways.

US West Information Systems has won contracts from the U.S. General Services Administration (GSA) to replace station equipment and small private-branch exchanges in four GSA regions.

The GSA will use the new equipment to replace hardware leased from multiple vendors. The equipment will be purchased or leased with an option to purchase during the next three to five years.

Nynex Corp. picked a tenuous time to team up with Citicorp and RCA to research and develop interactive electronic services such as home banking and shopping. The venture was announced a few weeks before the liquidation of Knight Ridder Newspapers, Inc.'s Viewdata Corp., the nation's first videotex company. That flop followed the demise of a similiar Times Mirror Corp. venture in Los Angeles.

AT&T From **page 11**
unwilling or unable to provide the access required for AT&T to meet the needs of its customers. It overrode that policy for the first time last year when Merrill Lynch asked AT&T to provide direct access to its network using Teleport facilities.

Unlike the Merrill Lynch deal, the new contract is driven by AT&T's business goals, not the desires of a single customer. Although details were not disclosed, use of the Teleport facilities cost less than that of New York Telephone offerings, according to Jerry Thames, general manager of network services with AT&T Communications.

Of equal, if not greater, concern than savings to AT&T is the availability of long-term contracts.

"Fixed price is one of the things we're concerned about in our efforts to hold costs down," Thames said. Facility availability and service flexibility also contributed to AT&T's decision to find alternatives to New York Telephone, he said, adding "New York Telephone refused to provide us with 45M bit/sec service."

AT&T will decide where and when to use the Teleport network to support customers on a case-by-case basis, guided by engineering concerns. When it gets an order for end-to-end service involving T-1 access to one of its three Manhattan points of presence, AT&T will decide whether to use New York Telephone or Teleport service, Thames said.

The cost to the customer is the same regardless of the carrier AT&T uses. If New York Telephone raised its rates for T-1 service, AT&T's end-to-end service rates would reflect that increase, but perhaps to a lesser degree. "It is our intention to structure our rate elements so that we pass through any added cost advantage we get by using Teleport," Thames said.

Customers can insulate themselves against these increases by building or contracting for their own access to AT&T's points of presence, possibly through Teleport. In this scenario, the user assumes responsibility for the local links and only pays AT&T for service between its network access points.

While customers requesting that AT&T assume end-to-end circuit responsibility will not be able to specify the local carrier used — Teleport or New York Telephone — Thames said AT&T will try to respect the customer's wishes. Teleport's fiber-optic network, for example, may be desirable to users with heavy data communications needs.

The signing of the Teleport contract appears to be the second chapter in a three-chapter novelette. In the first chapter, AT&T bypassed a former Bell operating company out of fear that the valuable Merrill Lynch business would vanish if AT&T did not use Teleport, as requested, as the access carrier.

In this, the second chapter, AT&T justified the need to contract for bypass facilities by saying the local telephone company is not responsive enough to meet customer needs; it does not, however, provide an economic incentive for bypass use.

In the final chapter, AT&T may try to lessen its access charge burden — fees AT&T and other long-haul carriers pay to local telephone companies to connect to local users — by offering an economic inducement for users to bypass the local telephone company. AT&T would probably have to be deregulated for this to become feasible.

Crybabies From **page 11**
with the Bell operating companies. We're not even getting notices as required by the modified final judgement of the consent degree," Hoffman said. "In May 1985, we started receiving Feature Group D equal access connections but haven't gotten one bill that has been acceptable."

GTE Sprint and US Telecom both laid some of the blame for their misery at the feet of the FCC, which is leaning favorably toward the deregulation of AT&T.

"If we didn't allow AT&T to change prices to reflect costs, an artificial ceiling would be set, which would encourage newcomers to overbuild. The consumer would lose," responded Peter K. Pitsch, chief of the FCC's Office of Plans and Policy.

The arguments twist around continually like a Mobius strip: the end is another beginning.

Having won the freedom to compete in what was once a monopolistic business, the newcomers have come to view their existence as a right, expecting help in their fight against the incumbent heavyweight.

AT&T still carries the weight of universal service — competing carriers use AT&T to support remote areas — but it obviously has many marketing advantages from the monopoly era.

What's fair? Whatever is best for the consumer. To breed the best environment — rife with reasonably priced service alternatives — a few strong competitors to AT&T must evolve.

Total deregulation of AT&T now would stymie, if not obliterate, the chances of this happening.

If you have one of these, you already use the CompuServe network.

Presenting the network chosen by Visa and leaders in every major industry doing business today.

CompuServe's value-added, packet-switched network has been developing an impressive list of customers.

Including major corporations. Government agencies. Nationwide associations. Universities. Banks. Hospitals.

For starters, here's how we've been helping Visa ever since 1983.

We've provided reliable dial access for telecommunications for thousands of Visa terminals in more than 2,000 cities.

Enabled Visa merchants nationwide to authorize credit card purchases in a matter of seconds.

Altered our software to streamline Visa's operations.

And we've continually explored ways to reduce phone charges. And make it easy for merchants to access the system quickly.

According to W. Thomas Castleberry, Senior Vice President, Visa U.S.A.,

"We selected CompuServe because they were technically responsive to the unique market requirements of a point-of-sale system. CompuServe was willing to meet our performance standards at a competitive price."

Now look at all the reasons you should put CompuServe to work for you.

1. Over 99.9% reliability.
2. A 300% increase in cities served since 1982.
3. Local customer support through over 30 offices nationwide.
4. Compatibility with all major protocols and equipment.
5. Management assistance programs to help you use the system.
6. Pricing tailored to customer needs.
7. Security through total customer control.

Check out the CompuServe network.

After all, we've been helping Visa and leaders in all sorts of major industries charge ahead for years.

Maybe it's time you let us do the same for you.

For more information, call CompuServe Network Services at 614-457-8600.

CompuServe Network

Please send your FREE "Network Nation" brochure describing CompuServe's value added network.

Name _____

Title _____

Company _____

Address _____

City _____

State _____ Zip _____

Business Phone _____

CompuServe®

Network Services
P.O. Box 20212
5000 Arlington Centre Blvd.
Columbus, Ohio 43220

NV 4303-24

An H&R Block Company

Visa and the Three Band Design are registered trademarks of Visa International.

DATA DELIVERY

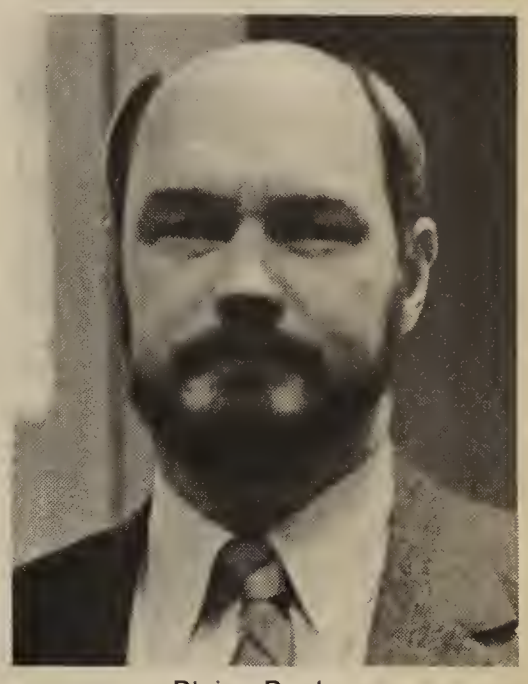
"Information about how a company uses its network is often as important as the network itself."

Dixon R. Doll
president and chief executive officer
The DMW Group, Inc.

▶ SPEECH RECOGNITION

First user not mum

AT&T Conversant I progress slow but steady.



Blaine Banker

BY PAUL KORZENIOWSKI
Senior Writer

BOSTON — Fidelity Brokerage Services, Inc.'s experience with speech recognition clearly illustrates the plodding pace that technology is taking as it moves from the laboratory toward commercial application.

More than two years ago, AT&T asked Fidelity to be an early user of its speech recognition system, the Conversant I Voice System. A speech recognition system allows users to input data via spoken words, which the system then translates into data for various applications. In theory, a speech recognition system should be able to understand any user's words.

Thus far, Fidelity has been happy with the progress of the pilot project, now in its final phase. The application allows the financial services company's customers to access investment information via telephone.

But AT&T seems to have some reservations about the product. Even though the Conversant I Voice System was billed as available when it was announced in September, AT&T said the product's full voice recognition capabilities won't be shipped until at least mid-year.

Fidelity manages customer stock portfolios, enabling customers to call the company daily for stock information, such as current stock prices or the number of shares traded. "Customers base buy-and-sell decisions on stock performance information," noted Blaine Banker, Fidelity's vice-president for national sales administration and manager of the Conversant project.

A clerical staff of approximately 20 workers was formed to handle these telephone inquiries. Working with a Digital Equipment Corp. VAX minicomputer, clerical workers query a data base where the informa-

Continued on **page 14**

DATA DIALOGUE
PAUL KORZENIOWSKI

IBM stretches the network feast

In one respect, IBM reminds me of my grandmother. She could take a 15-pound turkey and easily feed a family of seven for a week. No part of a bird ever went to waste. When the bones had been picked clean, they were used for soup.

Historically, IBM has taken a key product and satiated a market appetite for 15 to 20 years. This strategy first became evident in the mid-1960s with Big Blue's 370 mainframes. Unlike most competitive products, the IBM 370 was actually a superset of its predecessor, the IBM 360. Big Blue has continued to build on the IBM 360 in subsequent generations of hardware.

So, it's not surprising that IBM has used this strategy with other products, such as its System Network Architecture.

Just as the IBM 360 evolved to the IBM 3090, SNA has been gradually enhanced to support current technologies. Retrofitting old technologies to support current needs is as difficult as squeezing extra meals out of a turkey; both require compromises and a vivid imagination.

Few communications managers are enamored with recent IBM developments such as Document Content Architecture (DCA), Document Interchange Architecture (DIA), SNA Distribution Services and LU 6.2. These services have been layered on top of ancient technologies, a procedure that incurs a great deal of operating overhead and raises compatibility questions.

Enhancements to Virtual Telecommunications Access Method, today's SNA foundation, underscore this point. When SNA was developed, it easily supported any of the networks that were then in use.

By the early 1980s, networks at companies such as General Motors Corp., American Express Co. and American Airlines had grown so large that communications managers were running out of network address space.

To solve this problem, IBM introduced two enhancements: Systems Network Interconnection (SNI) and Extended Network Addressing (ENA). SNI, introduced in November 1983, is an SNA-to-SNA gateway. ENA, announced in August 1984, replaced the original SNA addressing scheme, which supported up to 64 hosts and 64,000 logical units. The new scheme works with up to 256 hosts and eight million logical units.

Large companies embraced SNI and ENA, and in most cases, the products worked well. However, they did not work at all in some companies. A few communications managers examined SNI and ENA and uncovered problems that took them, and IBM, by surprise.

One problem was that a few necessary features, such as automatic session restoral, were not easily supported. A second was that ENA was not compatible with older applications.

Solving these problems has been an expensive undertaking. American Express had to dedicate a mainframe to solve incompatibility problems. Mainframes cost millions, but even more important are lost business opportunities.

So, one thing communications managers should remember, when they read about and hear of the hoopla concerning DCA, DIA and LU 6.2, is that IBM is pushing turkey soup. For many of them, it will be a bitter meal to swallow.

IBM INSIGHTS

Coming soon from Big Blue? Bytek Corp. has enhanced its Autoswitch line of matrix switches so they support T-1 lines. The Autoswitch 240 "T" works with transmission speeds of 1.544M bit/sec or 2.048M bit/sec. Bytek supplies IBM with its 3278 matrix switch, so look for Big Blue to incorporate the new capability soon.

Set to go. IBM began shipping its Token-Ring Network last week, much to the chagrin of a few competitors who had predicted that the end of the month shipment date would slip by. United Airlines and Travelers Co. are two large users that have made significant committments to the Token Ring.

Going from N to X. NCR Comten, Inc. is scheduled to announce enhancements to its front-end processors that will link them to X.25 packet-switching networks. A large bank in California was interested in replacing its IBM front-end processors with NCR Comten boxes, but decided to stick with IBM. "NCR enhancements are available eight to 10 months after IBM's," said an NCR Comten manager. "We couldn't afford the delay."

What's to be with TPF? Future releases of IBM's Transaction Processing Facility (TPF) will rely less on the product's communications processing facilities and more on its application attributes. A few large companies have run into problems coordinating TPF's communications functions with Virtual Telecommunications Access Method's features. By relieving TPF of its communications responsibilities, IBM should be able to assure future releases of the two products will work together.

PRODUCTS & SERVICES

Two data products bow

Datagraf, Inc. has introduced a protocol converter that makes an IBM 3276, 3277 or 3278 device look like an Ascii terminal.

The **Series II 3270 Coax-to-Multidropped Protocol Converter** supports up to eight 3270-series devices and sits between the terminals and an IBM 3270-series cluster controller. A switch enables users to either send data to an IBM mainframe or convert it for use with an Ascii host.

With the Datagraf product, IBM terminals will mimic Burroughs Corp. ET 1100, Honeywell, Inc. 7700 series and Sperry Corp. UTS 20 devices. devices.

An eight-port version of the product costs $5,495.

Datagraf, Inc., Suite 100, 6626 Silvermine Drive, Austin, Texas 78736 (512) 288-0453.

Novell, Inc. added a diagnostic kit that tests its Netware/S Net and 68B file servers.

The **Server Diagnostics Kit** can be used to test a file server's console port, interface boards, printer board and memory.

The Kit can be preset to perform external tests either singly or in a series during a night or weekend.

The Server Diagnostics Kit costs $495.

Novell, Inc. 748 North 1340 West, Orem, Utah 84057 (801) 226-8202.

On March 4, Datagram is going to do to data communications what the Beetle did to the automotive industry.

On March 24, we're revolutionizing the data communications industry. Again.

See us this year at booth #2554. The Interface Show.

Fidelity from **page 13**

tion is continuously updated.

Fidelity has linked its Conversant system with the VAX so customers can directly query the data base. Recently, one system, which supports 16 dial-up lines, was installed. In September, Fidelity employees put Conversant through its paces, and two months later, some 30 customers began to access information through the system.

During the two initial phases, the firm mailed 1,000 questionnaires that asked customers if they would be willing to take part in a final test phase. Almost 600 customers agreed to participate, and in February, they were added to the system.

To use Conversant, customers are assigned account and personal identification numbers (PIN). After dialing into the front end of Conversant, the system will ask for the account and PIN numbers.

The system translates the customer's words into data and transmits that through a direct line to Fidelity's VAX. At that time, a user can input code numbers that correspond to various stocks and information about those stocks.

Banker said there have been few problems with the system. "The major problem was that many people slowed their speech down when using the system, and it has trouble recognizing that speech pattern."

A principal question about speech-recognition systems is what percentage of words a system accurately recognizes. Banker said the Conversant has an accuracy rating of approximately 95% — a figure that AT&T also stated when the product was announced.

During a demonstration at Fidelity's Boston office, the Conversant system worked well whenever Banker used it. When another person spoke, there was an occasional error: Either the system produced incorrect data or did not understand the data input by the user.

Theoretically, after a user recites the numbers one through 10, the Conversant is able to build a speech pattern that recognizes the user's speech. This, however, did not work in the demonstration.

The Conversant System has to be customized for each application, a process that can be be very tedious. An AT&T spokesman declined to estimate how much time or manpower a typical customization process would require.

Despite the minor glitches, Banker is optimistic about the system's potential. For the past two years, Fidelity's Mutual Funds department has used a similar system in which customers input codes by pressing numbers on a Touch-Tone telephone. That system, called Fidelity Automated Service Telephone (FAST), handles approximately 32,000 calls a day and in April will be expanded to handle 65,000 calls.

"Once the Conversant system is completely up and running, I think it will be as successful as FAST," Banker noted. "The Conversant system should enable us to cut clerical staff and more effectively service our customers."

FACTORY COMMUNICATIONS

Worcester Polytechnic Institute (WPI), Worcester, Mass., offers a special one-day executive briefing on "Computer Integrated Manufacturing: A Productivity Solution." The briefing covers a series of Computer Integrated Manufacturing (CIM) issues. The session will be offered beginning in Worcester at the Marriott on April 4. For additional information on the briefing and other planned WPI seminars, contact Kathy Shaw at (617) 793-5517.

▶ MAP AT WORK

IBM manages MAP project

Engineers linked to factory floor data.

BY BOB WALLACE
Senior Writer

IBM is trying to put Endicott, N.Y., on the MAP.

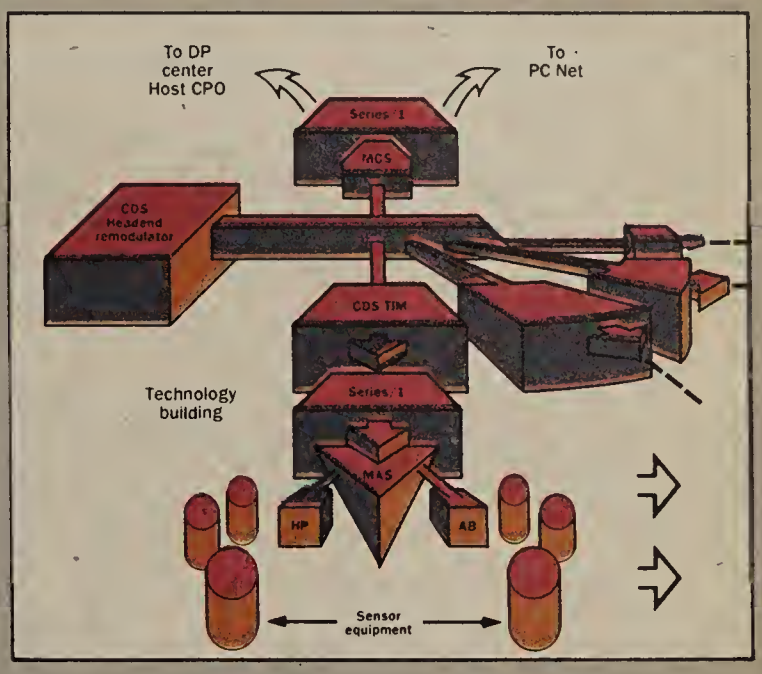
IBM is pilot-testing a process application within its Endicott technology plant. The Manufacturing Automation Protocol (MAP) application is designed to give company engineers access to factory floor data without having to leave their offices.

Rick Sheftic, Endicott's MAP pilot project leader, explained, "The project's goal is to provide our process engineers with a single access point to the various factory floor processes they interact with." The MAP pilot will also allow the engineers, using IBM Personal Computer XTs hooked to the PC Network, to access computing resources in the data processing center located in another building.

"The idea is to bring real-time process data into the engineers' offices, as opposed to having them go out on the factory floor and gather data from each stand-alone system," Sheftic added. This capability improves the engineers' ability to monitor the operation of a variety of factory floor production processes. The engineers will also

Continued on **page 18**

Endicott, N.Y. MAP application



CDS TIM	Concord Data Systems, Inc. Mapserver Token/Net Interface Module	MAS	IBM MAP Application Server software
MCS	IBM MAP Communications server software	HP	Hewlett-Packard Co.
		AB	Allen-Bradley Co.
Series/1	IBM Series/1 minicomputer		

SOURCE: IBM

FACTORY FACTS

BY BOB WALLACE

Manufacturing Automation Protocol: the uncommunications protocol?

It is time those connected to the Manufacturing Automation Protocol (MAP) movement abandoned their outdated preconceptions regarding the communications industry.

General Motors Corp. and the U.S. MAP users group recently announced a roving MAP demonstration that will visit numerous industry trade shows over the next few months. None of the shows are communications trade shows. Rather, they could be referred to as niche industrial expositions. Consider a few of the show titles: the Programmable Controllers Conference and Exposition, the Robots 10 Conference and Exposition and the Instrument Society of America show. In fact, the largest MAP demo to date was held at the Autofact '85 show.

Product managers from Allen-Bradley Co. and Gould, Inc. claim that when their sales reps sell factory networking or automation gear to users, they sell to committees — not to individuals with factory automation tunnel vision. They add that the committees are comprised of individuals from various departments in user companies.

High-level management representatives are usually present, as are those directly responsible for factory communications and automated manufacturing. What few seem to understand is that communications managers, data processing directors and MIS managers also sit on these purchasing committees.

Why not wheel the MAP demo into the Interface '86 show in Atlanta, the International Communications Association Show or the Telecommunications Association show? Interest in MAP is broad-based. Everyone from electrical engineers to chief executive officers is talking about the need to tie islands of factory automation together using communications nets.

A related aspect of the MAP movement that is in critical need of repair is education. Only a handful of organizations have established educational programs for those interested in learning about the theory and practice of MAP. Zatyko Associates, Inc., Tustin, Calif., and Ship Star Associates, Inc., Newark, Del., offer MAP, Technical and Office Protocol (TOP) and Open Systems Interconnect seminars for those looking for primer courses in those areas.

What is ironic here is that a series of MAP educational forums, produced by Greenwich Technologies, Troy, Mich., in conjunction with GM, will be offered at shows where the MAP demonstration will appear. Why not offer these primer seminars at communications shows where they could be attended by communications, MIS, DP and telecommunications managers?

The seven-vendor MAP/TOP demonstration wowed thousands at the 1984 National Computer Conference in Las Vegas. Why not give communications shows another chance?

INCIDENTALS

For those who missed the 21-vendor Manufacturing Automation Protocol (MAP) version 2.1 demonstration at the Autofact '85 show, a traveling MAP demonstration, featuring a subset of the original 21 vendors, may be coming to a trade show near you. General Motors Corp. and the U.S. MAP users group are cosponsoring the demonstration, which includes equipment from Allen-Bradley Co.; AT&T; Asea Robotics, Inc.; Concord Data Systems, Inc.; Digital Equipment Corp.; Gould, Inc.; Honeywell, Inc.; IBM; Intergraph Corp.; Industrial Networking, Inc.; Intel Corp.; Motorola, Inc.; and Siemens Communications Systems, Inc.

The MAP booth will be at the following shows: Programmable Controllers Conference and Exposition, April 8-10, Detroit; Robots 10 Conference and Exposition, April 20-24, Chicago; Society of Manufacturing Engineers' Tool and Manufacturing Conference and Exposition, May 19-22, Philadelphia; Automach, May 27-29, Australia; CAD/CAM and Robotics, June 17-19, Toronto; International Machine Tool Builders Association, Sept. 3-12, Chicago; and Instrument Society of America show, Oct. 13-16, Houston.

For more information on the SME sponsored shows, call them at (313) 271-1500.

Network Services. Communications solutions
responding to today's needs. And tomorrow's potential.

Network Services. A flexible, technologically advanced family of digital transmission services developed by the Bell Atlantic Companies to optimally match user needs to highly-efficient, cost-effective voice and data transmission services.

From basic voice circuits to our packet-switched Public Data Network to Central Office LANs to Digital Connect Service to the fiber-optic technology of our High Capacity Lightwave Service, Network Services offer custom transmission solutions at speeds ranging from 300 bps to over 500 megabits. On a point-to-point, multi-point or switched basis.

Looking to the future, Network Services arm today's businesses with building blocks with which they can tap the opportunities and limitless potential that lie in the Integrated Services Digital Network to come: ISDN. Where integrated information—voice, data and video—will be free to move at will. At any speed. At any time.

Backed by the resources and network expertise of the Bell Atlantic Companies, we're in a unique position to deliver customized network solutions of unparalleled value to the business-user.

By drawing on a wide range of services and unmatched experience, we can provide expert consultation as well as system design and implementation to ensure your system meets your requirements exactly.

Bell Atlantic Network Services, together with our continuing investment in the latest technologies, will expand your ability to use communications as an advanced tool for business growth. Responding to today's needs. And tomorrow's opportunities.

To find out how you can build your communications with Bell Atlantic Network Services, call toll-free 1 800 843-2255, Extension 8. Or contact your Account Executive.

Bell of Pennsylvania
C&P Telephone
Diamond State Telephone
New Jersey Bell

Bell Atlantic™ Companies

We make technology work for you.™

From **page 15**

be able to respond more quickly to system alarms generated from factory floor equipment.

Internal interest in MAP

The general goal of the Endicott MAP pilot is to bring MAP technology into the facility. "There is a tremendous amount of internal interest in the pilot," Sheftic said. "From an Endicott perspective, presuming the pilot is successful — and we are confident that it will be — other areas within the plant that deal with multivendor environments will look at implications of MAP for the way they do business."

Sheftic claimed the MAP network configuration will also provide a means of uploading factory floor data from four IBM Series/1s on the factory floor to a host mainframe in the facility's DP center. The center is located in a separate building from the MAP net. "Today there is a point-to-point line from each stand-alone system to the host computer.

> *"From an Endicott perspective, presuming the pilot is successful — and we are confident that it will be — other areas within the plant that deal with multivendor environments will look at implications of MAP for the way they do business."*

"When we install the MAP local-area network, the idea will be to send data up through the local net, through the gateway machine and then into the host," Sheftic explained.

The MAP pilot project, located in the facility's technology building, will produce multilayer circuit boards for the company's 3080 and 3090 mainframe lines. The software used in the pilot conforms with the MAP version 2.1 software used in the demonstration held in Detroit last November in conjunction with the Autofact '85 conference.

The Endicott pilot connects four IBM Series/1s to a 5M bit/sec coaxial network via Concord Data Systems, Inc.'s Mapserver Token/Net Interface Module. A fifth IBM minicomputer serves as a gateway from the network to the multibuilding complex's DP center and to a PC Network located in the engineer's offices.

The IBM PC network operates on the same cable as the 5M bit/sec backbone network. In order to attach the two networks, Sheftic's project group attached a Scientific Atlanta frequency translator unit to the PC Network.

Sheftic referred to the PC Network as an "active" network. He added that signal amplifiers and splitters are connected to the off-the-shelf PC Network.

The four Series/1 nodes are running IBM's MAP Applications Server software, while the gateway mini is using the company's MAP Communications Server software. Both packages were unveiled at Autofact '85.

Sheftic says acquiring experience with the IBM MAP software programs is another goal of the pilot.

The Endicott endeavor necessitated the creation of a six-person project team. The group consists of Sheftic, four software coordinators and a member of the site's telecommunications group.

The telecommunications staffer supervised the entire network design and installation and handled all interaction with product vendors, Sheftic said.

Find experienced vendors

Kel-Mat/D.A.K. Co., Pittsburgh, was hired to do the cabling for the broadband network. The company pulled all the coaxial cable and tuned the broadband network. Sheftic advised prospective MAP networkers to locate a vendor with extensive broadband radio frequency systems experience to install the cable.

"Rely on a professional vendor unless you are absolutely confident of your in-house skills," he warned.

Sheftic said the largest problem with installing the MAP application was the lack of MAP products available in September 1984 when the project was first announced.

"The number of vendors who had committed themselves to offering MAP products was severely limited," he reflected.

Two Reliable Systems

Nothing is more reliable than the predictable path of the solar system.

And nothing is more reliable than your LAN system using these GENERAL INSTRUMENT components.

X-Series LAN Amplifier—the only mainstation that offers fully redundant two-way communication, as well as plug-in status monitoring in one amplifier. Redundant power packs assure continuous operation.

Status Monitoring System—continually tests every active LAN component from the headend. It provides instant reports on how the system is functioning and offers the capability to make changes in the system remotely.

Transverter Redundancy Switch—continuously tests the primary and back-up transverters. It instantly switches to the back-up, when needed, allowing continued data flow at all times.

Standby Power—the SPS-RS redundancy switch offers automatic switchover to a back-up system power supply.

Whether upgrading or developing a new LAN system, trust these General Instrument products to maximize your system's reliability.

For complete information on our expanding line of modem, distribution, and headend products for broadband local area networks, ask for our new LAN catalog.

GENERAL INSTRUMENT

Local Area Networks
2200 Byberry Road
Hatboro, Pa 19040
(215) 674-4800

TeleResponse No. 1-800-Call-800 Code 01

COMMUNICATIONS MANAGER

"There is a lot of uncertainty in this business. But once you know the risks and the rewards, you don't mind taking a chance."
John Mott
director
Chicago Board of Trade

▶ PRODUCT

ASI video course out

Advanced Systems, Inc. announced an interactive video instruction course for spreadsheet users.

Thinking PC's Spreadsheets defines the major components of the spreadsheet, including the cell and its contents. The course outlines the commands that are necessary in order to build and edit spreadsheets.

An audio segment leads students through the construction of a Lotus Development Corp. 1-2-3 spreadsheet or Microsoft Corp. Multiplan spreadsheet.

The Thinking PC's Spreadsheets course may be rented for a monthly charge of $50 to $150 per module, depending on volume.

Advanced Systems, Inc., 155 E. Algonquin Road, Arlington Heights, Ill. 60005 (800-238-2626).

▶ EDUCATION AND TRAINING

Satellite schools save time, costs

Master's programs and short seminars available in computers and communications.

BY MARGIE SEMILOF
Senior Writer

Communications managers are saving money these days by sending their engineers to school via satellite rather than enrolling them in seminars or evening educational programs.

Satellite-transmitted educational programs, such as those offered by the Fort Collins, Colo.-based National Technological University (NTU), are offering users, including IBM, Hewlett-Packard Co. and AT&T, the chance to save on travel and hotel costs as well as minimize the time employees are spending away from their jobs.

NTU and the Atlanta, Ga.-based Association for Media-Based Continuing Education for Engineers (Amcee) jointly offer a master's degree-level program and short seminars in a variety of disciplines, including computer and communications sciences.

Amcee is a consortium of engineering schools that was formed in 1976. The consortium is headquartered at Georgia Technical University. It was originally a nonprofit marketing cooperative that offered noncredit short courses. Its rapid growth rate of approximately 30% per year led to the creation of NTU.

The organization's classes were originally distributed on rented videotapes. Increasing enrollment has

Continued on **page 20**

GUIDE LINES
BY MARGIE SEMILOF

Time wasters wanton

The results of a recent survey commissioned by a New York-based temporary personnel agency are anything but surprising. It reported that employees fritter away what amounts to approximately two months out of each year in unproductive time. The study adds that most employers and managers claim responsibility for employee laziness.

If employees are sleeping on company time, there is no one to blame but the employer. One way to break this expensive habit is to foster an environment that welcomes and rewards individual initiative.

It's no secret that some of IBM's shining success is directly attributable to the company's willingness to provide forums for employee ideas and to reward those who contribute. This doesn't mean that there are no workers sloughing off at IBM. But by encouraging higher employee involvement and productivity, the manager meets his responsibility and a challenge is tossed into the employee's lap.

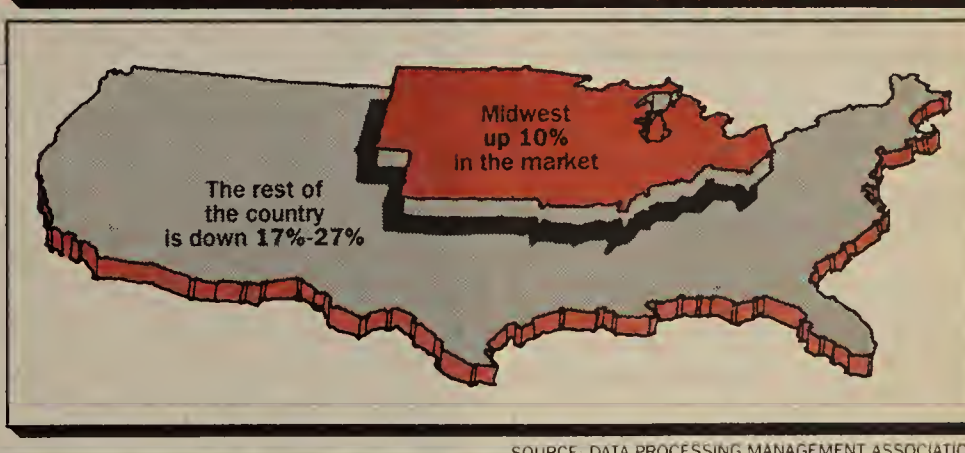
Irwin Gray, a New York-based management consultant and college professor who lectures widely on professional performance, claimed that 99% of companies have no formal mechanism to process employee ideas that may make a difference in a corporation. He suggests setting up a channel by which contributions may be funneled to senior management.

He claimed that when a company has no set method for screening employees' suggestions, many potentially productive ideas end up being pushed aside.

In some cases, employee initiative is squashed by an insecure employer who wishes to save his own professional hide, no matter who is hurt.

Incentives won't work for everyone, and if that is the case, there is still the possibility of doing some internal staff examination. There are employees who like to daydream and employees who like to work. Managers always have the choice of weeding out the snoozers and inviting them to work for the competition.

Midwest hires more data processing staffers



SOURCE: DATA PROCESSING MANAGEMENT ASSOCIATION

PEOPLE

Donald Hirsch has been named vice-president of planning and development for AT&T's Large Business Systems division. He will be responsible for the design and development of products and services for large businesses.

Hirsch has been with AT&T since 1960 when he joined AT&T Bell Laboratories. He most recently served as executive director of product management and development for AT&T's General Business Systems division.

John J. Reis has been elected president of Case Communications, Inc.

Reis joined Case in April 1985 as senior vice-president of marketing. He replaces the retired Michael Hafferty .

H. Raymond Eckman will join Lantel Corp., Inc. as its president and chief executive officer. He was most recently vice-president of operations at Scientific-Atlanta, Inc.

Eckman replaces Lantel founder and Presiden. **Robert T. Hughes**, who becomes executive vice-president of marketing and sales.

Peter M. Winter has been appointed president of On-Line Software International, Inc.

Winter most recently served as president of Digital Applications Ltd., a consulting and product development company.

Satellite schools from **page 19**
prompted the group to explore a satellite-based network, which the schools in the consortium financed. The satellite service has been operating since last autumn.

NTU's short seminars run an average of 10 hours. Each session is taught by faculty of the 33 universities that offer similar programs nationwide. Students take exams administered by an NTU-appointed monitor at their company. Exams are then returned to the instructor for grading.

According to NTU program founder Lionel B. Baldwin, a former dean of engineering at Colorado State University, subscribing companies buy a 12-foot Ku band satellite receiver station to draw in the live sessions. A typical installation costs as much as $10,000.

Seminars offered by NTU/Amcee include project management for engineers, local-area networks, packet switching and computer communications and networking. The network also runs short nontechnical classes on subjects such as stress management. A typical four-hour session costs the customer about $110. Many courses are offered later in the day when transponder service is cheaper. Most companies tape those sessions for later review.

Like any university, NTU offers a course catalog that outlines student requirements. Students are also assigned an advisor and there is a committee appointed for each curriculum. NTU does not provide equipment, but it does employ a consultant who recommends specifications relating to the required signal strength.

Ronald Lowe, manager of productivity and services with HP, coordinates satellite-based training at the HP facility in Colorado Springs, Colo. "Not all jobs are 40-hours a week," said Lowe, "But almost anyone can slip into a conference room and watch a videotape for an hour. When you have to drive 20 miles down the road and find parking, a one-hour class becomes a three-hour ordeal."

Lowe noted that there are some drawbacks to satellite education services. "Anytime you try to appeal to a mass market in the high-tech business, you must present a broad range of material to draw a significant audience," he said. "But as soon as you broaden your vision, you start losing customers that want a specific focus."

Managers also say it is difficult to choose subsequent seminars once students have seen an initial offering, because they fear it may just be more of the same material. Students also forfeit live interaction with classmates and the instructor.

Lowe said that most registrants believe there are more pros than cons to using a satellite university. "You are always hiring new people," Lowe said. "Basic training must take place that crosses them over to the real world. This network is a powerful medium for that job."

Users groups

The following are some of the organizations to be included in an April 7 *Network World* look at users groups.

Ad Hoc Telecommunications Users Committee
1150 17th St. N.W.
Washington, D.C. 20036
(202) 861-2600

Committee of Corporate Telecommunications Users
399 Park Ave.
21st floor
New York, N.Y. 10043
(212) 559-4900

Centrex User Group
CNA Insurance Co.
CNA Plaza
Chicago, Ill. 60685
(312) 822-5000
contact Dick Jennifer

Electronic Tandem Network User Group
General Electric Corp.
8 British America Blvd.
Latham, N.Y. 12110
contact Stephen Scott

International Association of Satellite Users (IASU)
P.O. Box DD
6845 Elm St.
McLean, Va. 22101
(703) 759-2094

International Communications Association (ICA)
Suite 600
1775 K St., N.W.
Washington, D.C. 20006
(202) 293-2435

Society of Manufacturing Engineers (MAP users)
P.O. Box 930
One SME Drive
Dearborn, Mich., 48121
(313) 271-1500

Ungermann-Bass, Inc..
Net/One Users Group
Box 566
Wills Point, Texas 75169
For more information, contact a local UB sales office.

— Margie Semilof

Who says N.E.T.'s T1 network is compatible with AT&T? MCI? GTE? United Telecom? ASC? The RBOCs?

▶ Q&A

Networking on the Chicago exchange

John Mott has been the Chicago Board of Trade's telecommunications director for two years. Before that, he spent 20 years in the U.S. Army Signal Corps, where he operated a variety of communications schemes. The Board of Trade operates a shared tenant service for its members who wish to connect to one of the other five trade exchanges in the city: the Chicago Board Options Exchange, the Chicago Mercantile Exchange, the Midwest Stock Exchange and the Mid-America Commodities Exchange.

Senior Writer Margie Semilof recently spoke with Mott.

What percentage of the communications is handled by an outside carrier vs. a bypass system?
Approximately 20% of our communications bypasses the switched network. I consider the fiber links and T-1 carrier as a form of bypass.

Is there any difference in the difficulty of acquiring services, such as T-1 lines, from AT&T or another carrier, compared to a year ago?
We acquired our T-1 lines from AT&T last year. The phone company was very slow and the circuit was not engineered properly. Since then, the service has improved considerably for all the carriers.

I think the long-haul carriers are finally realizing that they are in a competitive environment. If they do not perform, someone will shut them off.

How do you compare the quality of service from all of your different long-haul carriers?
As long as you don't exceed the carriers' capabilities, they all are fine. Argo Communications Corp. provides good service between major cities. When Argo leaves its network, the quality goes down very rapidly. AT&T is still *the* telephone company. They do the best job, but the prices are not very competitive. MCI Communications Corp. is fine for international calls, but domestically their quality does not compare with other vendors.

In which area did you realize your biggest cost savings?
By installing T-1 links to New York. Taking that traffic off the switched network was a big help.

Describe your network management system.
We are installing a product to check parameters. We selected this product because we do not have to take the trunk out of service to measure its performance.

For our New York location, we are using Computerware Corp.'s Telephone Facility Management System. Our old billing system just was not doing the job, and we decided to replace it with a product that could do other functions like cable, customer and equipment inventory; trouble reporting; and network management. Of 14 companies, only Computerware came in and showed us a product.

> *"Don't believe the vendors. They will promise you anything."*

Where do you find qualified employees to run the network?
We train them ourselves. There are also plenty of seminars run by AT&T, other vendors and the local operating company.

Illinois Bell is experimenting with an integrated services digital network service offering. How much would an ISDN environment change your network?
The concept of ISDN is excellent. Illinois Bell has been very progressive with technology and deregulation. I would like to see them do a quality implementation, but so far all I have seen are pretty pictures.

Any advice you care to offer other communications managers based on your experiences?
Yes. Don't believe the vendors. They will promise you anything for your business.

One vendor got in the door by telling us they could give us an average cost per minute of 22 cents. For general calling patterns, that is a good price. We dropped that vendor when the bills started coming in for 26 cents per minute.

They do.

The Justice Department broke up the Bell System to create competition. Here it is.

Now all these T1 suppliers are competing with each other to get your business.

They'll all tell you that our IDNX™ premises-based transmission resource manager is compatible with their T1 offerings. Yes, even AT&T though they'd rather sell you their own equipment and services.

So how do *you* win?

Consider the experience of our customers—now over a dozen leading U.S. industrial, transportation, and financial institutions.

These customers use our IDNX transmission resource managers to build private, wide area T1 networks.

Networks that integrate data, voice, and video traffic, simplify the job of managing communications, give you *control* of your network, and pay for themselves in a matter of months.

For our customers, the more T1 carrier options, the merrier. More choices, for optimal configurations such as hybrid public/private networks. More ways to save money, as the suppliers escalate price competition. And more control over data and voice communications.

Our customers are *winning* in this post-divestiture period of claims and confusion.

If that is *your* corporate communications objective, then consider becoming an N.E.T. customer yourself.

Here's what puts N.E.T. customers ahead:

First: *Functionality.* Data. Voice. (Including compression.) Video. The ability to integrate *any* equipment into an intelligent, expandable private network. With more features and capabilities than alternative equipment. Compare.

Second: *Compatibility.* With existing communications standards. With the emerging ISDN standards. And with all major T1 common carriers. Again, compare.

Third: Unequalled *reliability.* Our technology, through designed-in, nonstop redundancy and an intelligent, self-healing network architecture means our customers' critical applications have *higher availability*—the true measure of reliability. We invite comparison.

Fourth: Our *service.* Beyond maintenance, a system that can be diagnosed quickly, from your offices or our 24-hour-a-day, seven-day-a-week Technical Assistance Center. Down to the board level on any network node. Service that extends to network design and planning. Service that makes the task of building a private corporate network *practical.* Compare.

Finally: Our *proven* success. With installations all over the U.S., we have solved the thorny problems that are still merely on paper at most of our competitors. By all means, compare.

Call for this free brochure:
1-800-232-5599 Dept. N20
in CA: 1-800-227-5445 Dept. N20

The critical T1 issues. And answers.

NETWORK EQUIPMENT TECHNOLOGIES

400 Penobscot Drive, Redwood City, CA 94063, 415-366-4400, TLX 171608
Network Equipment Technologies has applied for trademarks for Network Equipment Technologies and IDNX.

OPINIONS

TECHNOLOGY

JAMES CARLINI

Cabling: a hidden asset

How many of you have opened up that wire or telephone closet in your building to find a strategic asset for your company? Not many, judging from the lack of emphasis many companies place on understanding the importance of cabling distribution management within their telecommunications and information technologies areas.

Telephone wiring distribution and management was always left up to the local phone company before the AT&T divestiture. Telecommunications managers had more interesting projects to work on, such as long-distance network carrier evaluation, equipment purchases and leases and other more important concerns. Since divestiture, cabling distribution and management have blossomed into an industry.

The local telephone operating company no longer concerns itself with managing the cabling within a building unless the tenants order Centrex service. This new responsibility has crept up on tenant telecommunications managers as well as the property manager within a multitenant facility. The end user is increasingly responsible for voice as well as data communications cabling requirements. As a result, cabling distribution within a building has become a critical area of concern.

Cabling distribution consists of vertical, or building-wide capabilities, and horizontal cabling capabilities within each tenant's premises for voice, data and video communications.

In a multitenant building, the responsibility for vertical distribution of cabling rests upon the property manager. A communications manager in charge of a total cabling distribution should focus on the cabling requirements for all types of information transmission, taking into account that the wiring scheme has a much longer life cycle than the technology connected to it.

Horizontal cabling capabilities are sometimes neglected by end users, who often believe that some outside entity will provide these capabilities without too much input from the users.

There are several standard wiring schemes that can be adopted. These include the Premises Distribution System from AT&T, the IBM Cabling Plan and other proprietary wiring schemes that provide the user with some level of standardization.

As a practical note on adopting these wiring plans, any wiring scheme should be put in place according to manufacturers' specifications.

In a recent case, a financial company was moving into new office space and specified the need for the IBM Cabling Plan. The electrical contractor substituted the wrong type of wire. The specs called for low-capacitance, solid 22-gauge wire, but the contractor installed high-capacitance, stranded 22-gauge wire in conduit.

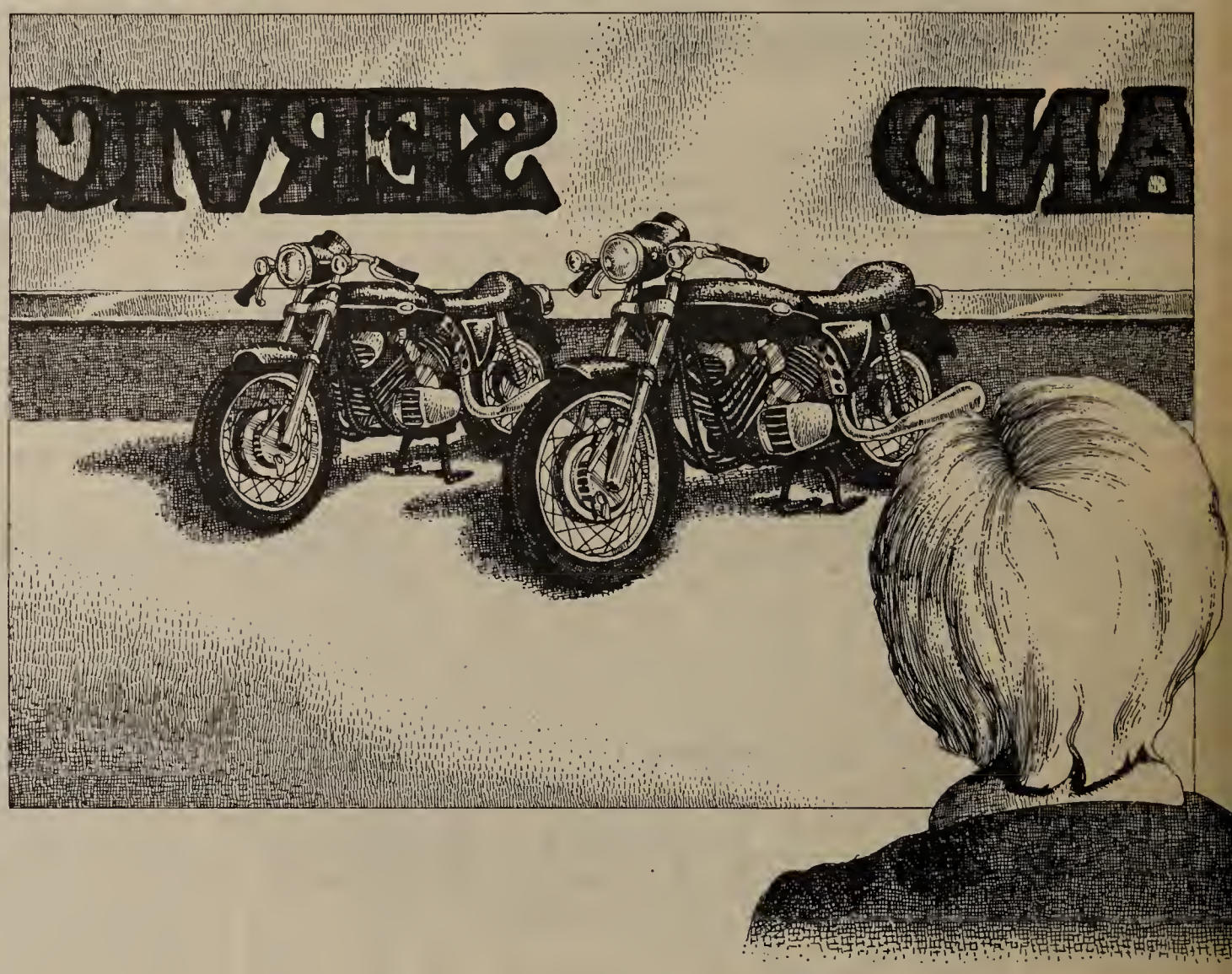
The results were that IBM terminals connected into the cabling performed normally, but when Wang Laboratories, Inc. terminals were connected, the Wang

Continued on **page 41**

Carlini is president of Carlini & Associates, a management consulting firm in Westmont, Illinois.

PRO:

Integrating voice and data on a single private branch exchange is the choice for savvy users. In addition to supporting higher data speeds than stand-alone data PBXs, integrated PBXs reduce wiring costs, simplify network management and are more flexible in multivendor networks.



Should voice/data

BY HENRY E. THELOOSEN
Special to Network World

Many MIS and network managers are realizing that an ideal solution to their data-switching needs already exists — in their organization's private branch exchange. Often, the digital PBX is already in place and allows data users to start switching data gradually. Furthermore, advanced digital PBXs offer advantages not available with any data switch on the market today.

Why switch data through a PBX?

In networks employing the PBX in conjunction with protocol conversion, users of less expensive Ascii terminals can access host computers supporting synchronous or bisynchronous protocols. This results in reduced costs for terminals by eliminating the need for several special purpose terminals and makes network interaction, including data call setup and placement, more uniform and easy to learn.

Most existing and developing networks are heterogeneous, a mixture of many types of devices from many different vendors. This means that any device used as a foundation for data switching must support a wide variety of equipment and communications modes and protocols to be truly functional.

An integrated digital PBX meets this criterion admirably. Not only can it support a variety of device interfaces and protocols, but hubs of local-area, or special-purpose networks can be connected through the PBX as well. The PBX supports multiple terminal types, including synchronous, bisynchronous, 3270 displays, personal computers and, of course, asynchronous terminals. Higher speed communications between host computers at up to 56K bit/sec, or through T-1 connections, are also possible with a PBX. The PBX can therefore be used as a backbone to connect entire networks as well as devices.

Another advantage of using the PBX for switching data is that some major PBX vendors make it easier to network with various terminals and host computers.

For instance, Northern Telecom, Inc. has an integrated systems program that specifically addresses the compatibility of other manufacturers' data processing equipment with its integrated network. Customers are assured that interface specifications and protocol handshaking issues are being ironed out and a structured program is in place for getting questions answered.

Use of a PBX for data switching has other unique advantages. Networks built around synchronous terminals usually require additional special cable, mostly coaxial. If a facility is not already equipped with such cable, the cost of its purchase and installation can exceed that of the switch and terminals combined. Also, keeping track of these separate data lines can become unmanageable.

A data-capable PBX makes use of existing, well-understood and inexpensive wiring: the same twisted-pair of copper wire used to connect most telephones. This greatly reduces data-switching costs, both at installation and when the network is expanded. It also allows devices to be connected as much as 800 feet from the host computers.

Cabling and universal connectivity are both examples of the PBX's greatest strength as a data switch: It takes maximum advantage of resources and skills already in place in most organizations. Periods of adjustment, inventory of communicating devices and other necessary elements of data switching are made easier, because the data devices can be treated and

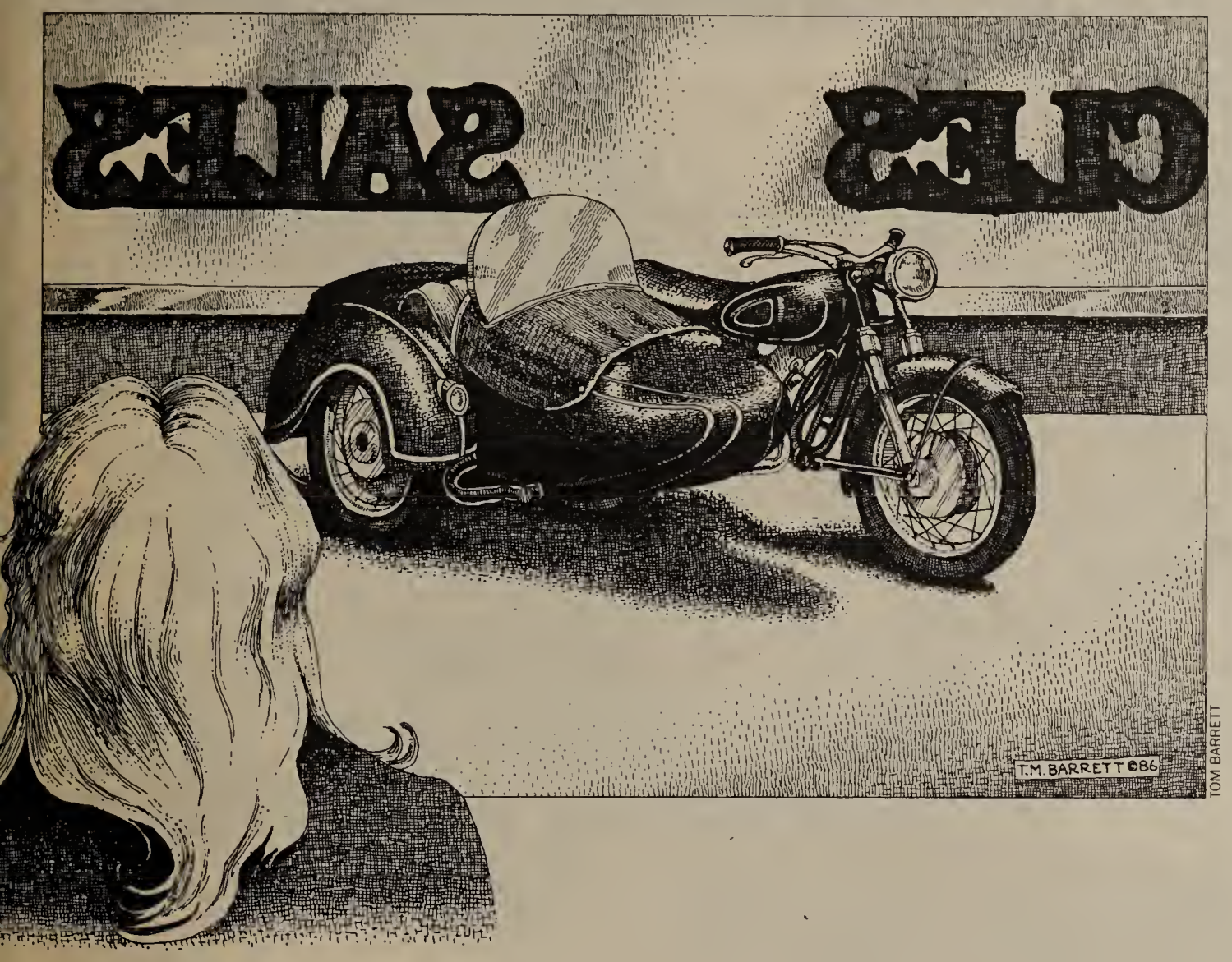
Continued on **page 41**

Theloosen is director of product line management at Northern Telecom, Inc.

CON:

Despite all the attention lavished on integrated voice/data private branch exchanges, users are better off with separate switches for voice and data. A separate data PBX provides cheaper, more efficient data communications — and has no negative impact on voice traffic.

The "con" integration argument:



switch in tandem?

BY ASHOK DHAWAN
Special to Network World

Combining voice and data in a single private branch exchange is of questionable value to users and their organizations. While many telephone PBXs offer data support as an adjunct to their primary voice capabilities, the combination proves costly, and design trade-offs generally favor voice over data.

Due to fundamental differences between telephone voice communications and terminal data traffic, a similar-but-separate circuit-switching approach provides greater user satisfaction at greatly reduced expense.

This technical and economic reality led to the development of data-only PBXs and their often overlooked, yet widespread, use. At least 10 companies are currently active in the data PBX market, and today, thousands of data PBXs installed worldwide support literally millions of users and resources.

Why separate instead of integrate? Economics first: Current prices for data connections range upwards from $650 on integrated voice/data PBXs, compared to $150 and less on a typical data PBX.

More to the point, voice and data are different, their users have different needs and expectations, and a PBX optimized for one will compromise the other.

Contrast telephone use with terminal use. Pick up the phone, dial a number, exchange verbal information, and hang up — on average, calls last only a few minutes. A terminal-to-computer connection is different: connect to a resource, log on, access some data, thinkabout it, access related data, think about it and so on. Computer sessions typically last much, much longer than phone calls. Some sessions last for hours, or even an entire workday.

Most voice PBXs switch digitized telephone conversations at 64K bit/sec and generally offer data rates ranging to 56K bit/sec or 64K bit/sec; a few support much faster rates up to the megabit per second range. Data PBXs generally support top speeds of up to 19.2K bit/sec.

On the surface, voice/data PBXs have at least a threefold speed advantage, but this is pure overkill. Most applications can't use this speed, since few, if any, interactive computer ports or terminals operate at speeds beyond 19.2K bit/sec.

High-speed resource sharing and intercomputer communications are better performed with virtual circuits and a packet-switching approach, such as Ethernet. In addition to faster speeds and greater flexibility, Ethernet also is less expensive than an integrated voice/data PBX: a cost of $400 to $500 per attached device is typical.

Since data devices use switching capacity much longer than phones do, one terminal may load the voice/data PBX as much as several telephone extensions would.

This can impact service, and, in some switches, blocking may occur, preventing users from making or receiving calls.

Inefficient use of bandwidth, compounded by longer connect times typical of data terminals, can lead to an overloaded PBX, requiring a larger, more expensive switch.

A related problem arises in tandem applications where PBXs are interconnected through trunks. Voice trunks generally support 24 simultaneous connections using T-1 links; the same link can easily support 128 9.6K bit/sec data channels, using commercially available T-1 multiplexers optimized for data, rather than voice.

Continued on **page 41**

Dhawan is general manager, Data PABX Systems Group, Micom Systems, Inc., Simi Valley, Calif.

MODERN MANAGEMENT

WALTER ULRICH

Information: the new weapon

The changing role of information requires new communications approaches. Information is now regarded as a strategic resource and weapon by many companies. Some industries are using information to gain significant cost advantages, while in other industries, companies are forging special relationships with their customers using information technology.

The implications for communications networks are enormous. Expanded application of information sharply increases the demand for flexible communications systems. Communications plans, architectures and delivery methods must change to meet new requirements.

Several specific communications requirements can be easily identified, including widespread distribution of information throughout the organization, access to outside data resources, and flexible access to other companies.

Internal Distribution

Organizations collect a great deal of data in the operation of their businesses. Much of this data has strategic significance. In years past, however, strategic data was wasted.

For example, purchase order information is essential to the manufacturing, shipping, invoicing and accounting processes. However, purchase orders also contain strategic information.

Are orders getting larger or smaller? What are the popular product combinations? What are the buying patterns, and how are they shifting in different geographic regions? Today, smart companies are making sure this information shows up not only in financial reports, but also in the strategic plan.

In the old days, preformatted reports were printed on a periodic schedule. These were distributed to operating managers to help them make routine decisions. But strategic information must be available on an ad hoc basis, with no specific format, to professionals anywhere the information is needed.

Marketing managers, strategic planners, and high-level corporate executives are the consumers of strategic information. The communications network must reach people within the company it has never had to reach before.

Offices must be wired that have previously been pristine. Access must be simple, direct and convenient for people who have neither the interest nor the patience to deal with technical complexity. Universal, transparent information distribution is no small task for the network manager.

Internally generated data, however, presents only a fuzzy picture. Changing demographics, the economy and external factors are critical elements in putting the data into context. Access to outside data is essential. The integration of internal and external factors provides valuable information and great insight for top-level corporate management.

Information and outside data bases must be available for corporate use in electronic

Continued on **page 41**

Ulrich is president of Walter Ulrich Consulting, Houston.

WHATEVER YOUR NETWORKING NEEDS,

WE MAKE THE PIECES FIT.

Maybe it's simply linking all the personal computers in one department so they can share information.

Or perhaps it's giving a PC in sales access to the mainframe in accounting.

Or opening the lines of communications between equipment made by different manufacturers.

Or maybe it's accessing a mini on the West Coast with a terminal on the East.

Or maybe...we could go on and on, but you get the idea. In order to get the most out of the equipment you've invested so heavily in, the pieces have to work together. But there's no one simple networking solution because there's no one simple networking problem.

This is where AT&T comes in, with a complete line of networking and communications products that can address your problems, whatever they may be.

FITTING IN WITH OTHERS.

AT&T has the range of products to fit your business' specific networking needs, now and in the future. And you won't have to start from scratch because AT&T is committed to putting your equipment on speaking terms no matter where it is, what it does, or whose logo is stamped on it.

Take the first case—linking PCs. AT&T's STARLAN NETWORK can get your PCs sharing information and peripherals. After all, unless workloads require otherwise, it's less expensive for several computers to share one printer, rather than each having its own. If it's minis you want linked, AT&T's 3BNET gets our **UNIX**™ System family of computers and other data devices sharing both information and applications.

ISN: THE BACKBONE.

Now let's say you want a network that extends beyond a single department. AT&T's Information Systems Network (ISN) is the answer. It not only opens up communications between our own equipment and networks, but also those of other manufacturers.

With ISN, you can connect to industry standards, like the IBM* SNA or 3270 environments. You can also bridge to Ethernet** systems. So a PC or workstation in one department can access an

© 1986 AT&T Information Systems

AT&T Has A Networking Solution.

IBM mainframe in another. Essentially that's like putting a mainframe on every desktop.

How is AT&T able to bring so many disparate elements together? One reason is our Premise Distribution System, our unique universal wiring scheme, composed of twisted pair and fiber optics. It's easy to install and manage, and is a long-term cost-effective alternative to bulky coax-based systems.

CROSSTOWN OR CROSS-COUNTRY.

You can also link AT&T System 85 or AT&T System 75 PBX to your ISN for total voice and data network integration. For a campus environment, fiber optics, T-1 facilities and AT&T's Private Microwave equipment can also feed into ISN for low-cost, high-speed data transmissions.

Now for the next logical step—linking your New York office with your Los Angeles office to form a corporate-wide network. This is accomplished by linking their respective ISNs, giving users in one location easy access to resources in both locations.

GET TOGETHER WITH AT&T.

AT&T products have a modular design, so you can build your network one step at a time, adding and changing as your needs dictate.

To get the most out of your system, get together with AT&T. Because an office divided cannot stand.

Call your AT&T Information Systems Account Executive. Or call 1 800 247-1212, Ext. 223, for the number of the sales office nearest you.

* IBM is a registered trademark of International Business Machines Corp.
** Ethernet is a registered trademark of Xerox Corp.

AT&T

The right choice.

NETWORK WORLD

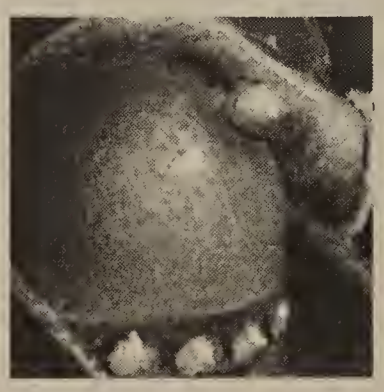
Features

March 24, 1986

Network support
Confusing. That's the word for the messy new market in network support services. Who offers the best network support in today's multivendor world? New research from the Ledgeway Group sorts it all out. **This page.**

Which hat to wear?
"Joe Cool" communications managers think they're hot, but they're not. The real communications manager knows better. Here's how to tell who's who. **Page 33.**

Assuming a new identity
Communications managers: Your relationships with users and vendors are changing rapidly. If you're not on top of these changes, you may wear an old hat at the wrong time and harm a valuable relationship. **Page 31.**



Getting the facts faster
These days, even news reporters are thinking digital. Voice, text and video integration? It's happening fast at NBC. The big broadcaster is busy pushing the state of the art in newsroom communications. **Page 35.**

Ford revs up its factory act
Slick software? Virtual nets? Henry wouldn't know the place. The automaker that once humbled the Italian Ferraris at LeMans is revving up again. This time, Ford is out to show the world that GM's not the only one with a hot-rod network. **Page 39.**

RESEARCH REPORT

Network support

New research gives some guidance in a particularly murky area of user concern.

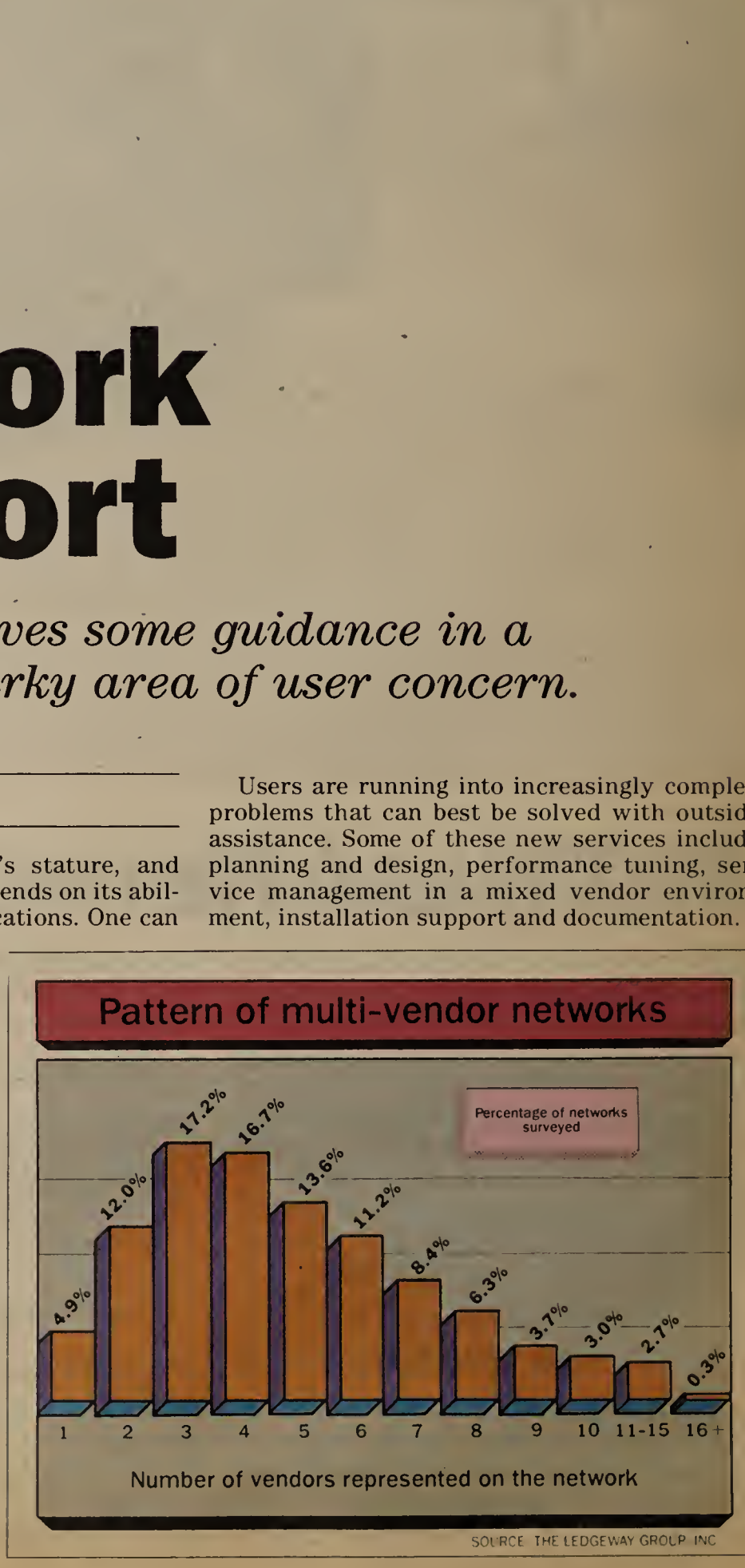
BY RICHARD C. MUNN
Special to Network World

In many industries, a firm's stature, and sometimes even its survival, depends on its ability to provide quality communications. One can hardly imagine a modern airline or a financial institution operating without instant, reliable data communications. Today, the corporate data communications network is the soul of company operations.

As the importance of the information network to a company's operations and its competitive stature increases, it is not surprising to see corporations and institutions express growing interest in a number of new network support services that differ from traditional installation, maintenance and educational services and represent more advanced and softer, or more flexible, services.

Munn is managing director, The Ledgeway Group, Lexington, Mass.

Users are running into increasingly complex problems that can best be solved with outside assistance. Some of these new services include planning and design, performance tuning, service management in a mixed vendor environment, installation support and documentation.



JOHN KILROY

The evolving network support marketplace

The Ledgeway Group, a market research consulting firm that focuses on service and support issues within the communications and information systems industries, recently completed a six-month study of the network support service marketplace.

The study featured a mail survey that went out to 3,600 senior communications and information systems managers, videotaped customer focus groups and nearly 100 interviews with customers, vendors and industry analysts. Customers were asked to comment on their interest in a variety of new service and support products, who they would turn to for those services and what criteria would be applied in their selection process.

As part of this study, Ledgeway forecasted that the overall market for network support services will grow from $2.5 billion in 1985 to $9.2 billion in 1990 at an annual average growth rate of between 27% and 30%.

As indicated in Figure 1 on Page 28, the major portion of the network support services market consists of traditional services such as installation, ongoing maintenance, customer education and software support.

Although installation services are normally bundled into the purchase price of products, the study forecasts the installation price that could be charged for nonbundled services.

A smaller portion of the market consists of the new, softer services. These new services are currently being performed by customers themselves, by smaller specialized consulting firms or by large vendors on an ad hoc basis for selected customers. This market segment represents the fees that vendors *could* charge. Conversely, they represent the cost that customers are absorbing to perform those services.

From the customer's perspective, there are some advantages and some disadvantages associated with the flurry of activity in the network support service marketplace. On the good news side:

- These services are available from a wide range of vendors, including large computer companies, regional Bell operating companies, AT&T Information Systems, data communications equipment manufacturers and third-party maintenance vendors;
- Vendors are eager to sell customized service products that take into account user's specific service requirements;
- Vendors are offering sophisticated products, for example, network modeling, fault diagnosis and network management system software, as well as training courses that eventually allow customers to perform these services by themselves.

These products are being developed and marketed in response to the needs of those customers who:

- Desire a "dating" relationship with a service vendor rather than a "marriage" relationship;
- Require products and services that will allow them to develop in-house competence in performing the new services.

On the bad news side:

- These services break new ground. As such, customers must learn how to budget for these services and the specifics of how these services work. Many users of networks fail to budget adequately for these new network support services, and as a result, they struggle through complex installations trying to get help from any quarter they can.

Furthermore, there appears to be no clear-cut standard for customers to compare proposed support service costs. Focus group sessions with network support service users indicate that users are still grappling with how to evaluate properly these new network support services.

- There is a significant gap between customers' perceptions of what network support service vendors currently offer and what these vendors actually offer. Some vendors may need to reexamine whether their sales force or service organizations are doing an adequate job of educating

Continued on **page 28**

NETWORK SUPPORT

From **page 27**

customers about their new service product lines.

■ Focus groups reveal a distinct tendency among users to distrust a network planning and design or specialized network consulting service offered by one of the major hardware vendors, such as IBM, Digital Equipment Corp. and AT&T.

Evidently, the basis for this distrust is a gut feeling that any proposed network design or solution would be heavily biased toward that particular vendor's products. Prospective users of these services will need to do some careful thinking about which vendors they could trust to have in-depth knowledge of all the products available and be in a position to provide an unbiased recommendation.

Who performs these services?

During the past six months, Ledgeway conducted an extensive survey of network support services offered by 18 vendors, including large computer companies, AT&T Information Systems, RBOCs, data communications equipment manufacturers and third-party maintenance vendors.

Figure 2 summarizes the traditional and new network support service products that these vendors currently offer or plan to offer in the near future.

The survey results indicate that vendors have various strengths in terms of their network support service capabilities. The overall network support service marketplace is at a very early stage of development, and vendor positioning in this marketplace will most likely undergo considerable flux.

As a general rule, the selling points of the large computer companies are network software support, customer education and system tuning.

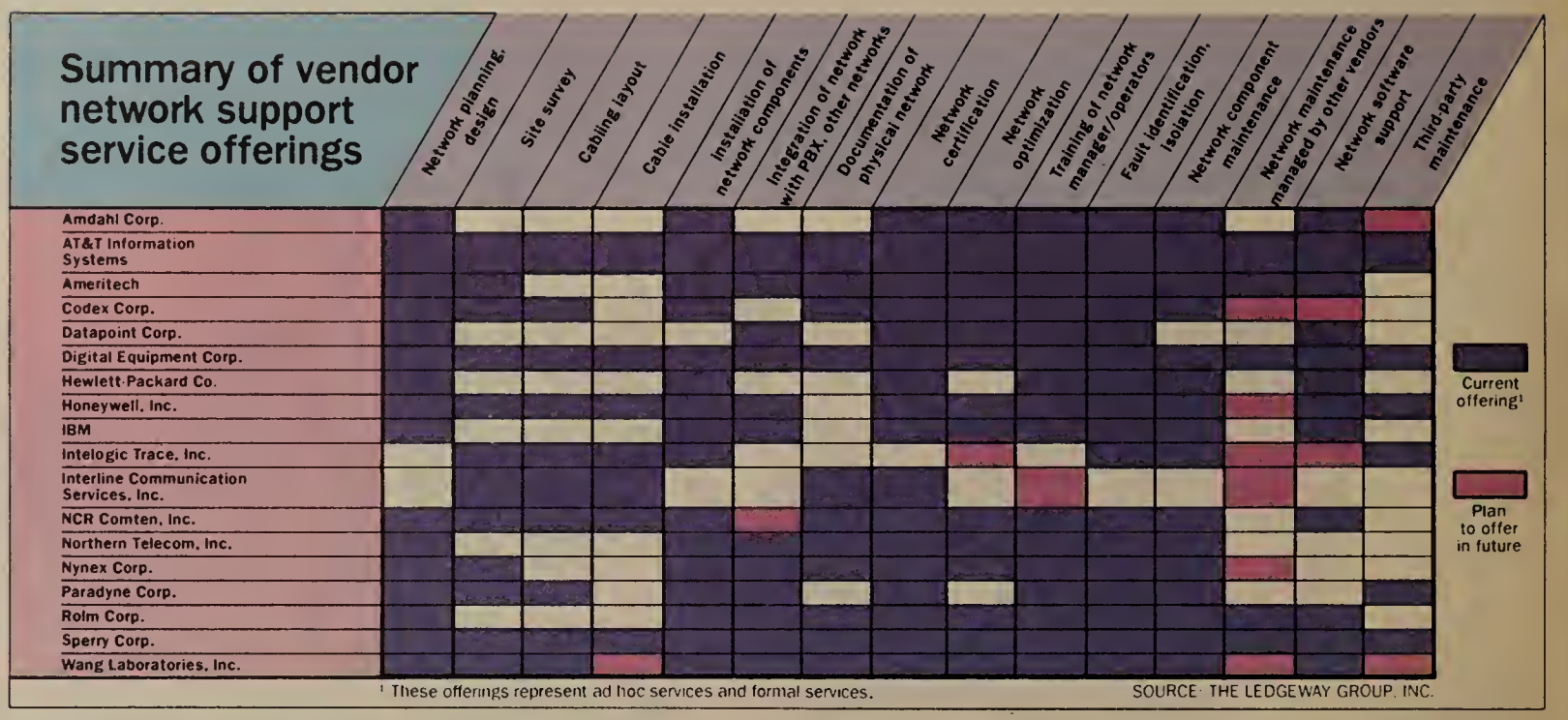
Network software support is a natural attribute of the large computer companies since they have service organizations that contain sizable in-depth software support resources. In addition, these companies are often the primary designers and suppliers of network software products.

Similarly, network performance tuning is a natural forte for the large computer companies because, by its very nature, tuning requires the expertise of a skilled software professional who understands the operating and application software used at the customer site.

Big firms offering more training

Technical training has always been a natural strong suit for the large computer companies, particularly in the computer systems area where they have accumulated considerable experience and secured customer loyalty in training customers to implement, operate and maintain their own computer systems. The large computer companies are steadily expanding and updating their portfolio of training offerings in order to incorporate courses on the implementation, operation and management of network systems.

Summary of vendor network support service offerings



¹ These offerings represent ad hoc services and formal services.

SOURCE: THE LEDGEWAY GROUP, INC.

Confused about network management?

AT&T Information Systems is well-positioned in the network support service marketplace, particularly in the traditional installation and maintenance services that AT&T Information Systems provides for network components (for example, private branch exchanges, modems, multiplexers, network processors, network controllers and network management systems), premise distribution systems and local-area networks. AT&T Information Systems is currently expanding its range of service offerings beyond these traditional installation and maintenance services to include:

- Facilities management, whereby AT&T Information Systems provides fault isolation and service management for customers operating in a mixed-vendor environment;
- Consulting services such as network analysis/design, systems integration and preparation of network specifications;
- Project implementation management services such as total project management, network documentation and network validation and testing;
- Contract and operations management services, including management of contracts that customers have with other vendors, network operations management and ongoing operator training.

"Furthermore, if AT&T Information Systems were to establish a strategic coalition with a large computer company, it could potentially become a viable provider of additional new services such as network optimization and tuning."

It appears that AT&T Information Systems' objective is ultimately to provide a single source of service and support to communications network users. Furthermore, if AT&T Information Systems were to establish a strategic coalition with a large computer company, it could potentially become a viable provider of additional new services such as network optimization and tuning.

The RBOCs are actively developing or investigating new network support service opportunities covering the full gamut from network planning and design to network implementation and service management. At the present time, it appears that their strong suits are in the areas of network planning and design for fiber-optic networks and multinode electronic tandem networks.

Many of the RBOCs already have or are currently developing advanced remote diagnosis centers that are capable of 24-hour monitoring of customer premises-based switching equipment and network trunks serving the equipment. These remote diagnosis centers are expected to enhance their capability to provide the fault diagnosis and isolation services that are integral to network service management.

The strong suits of medium to large data communications companies are in the areas of network planning and design, fault isolation and diagnosis and specialized training services.

In the near future, a number of data communications companies are expected to offer remote fault diagnosis and network management assistance services to smaller companies with limited in-house technical support staffs who require supplementary consulting on an occasional basis.

Third-party service organizations are taking aim at the network support service marketplace. Their strengths are in the areas of network cabling installation and network component maintenance. Many of these third-party service organizations plan to offer one-stop maintenance service eventually for all telecommunications equipment — for example, PBXs, telephone station equipment, local-area networks, modems and so on — at a customer's site.

What criteria should be applied?

In the mail survey, Ledgeway asked users or potential users of network support services to rank the importance of various factors used in selecting a service provider. The most important factors were:

- Responsiveness to customer needs. How willing is the vendor to

Continued on **page 30**

It's time for some straight talk.

Managing your network means more than just monitoring modems.

Many vendors claim they can sell you a "network management" system:

• Modem companies offer a computer-controlled modem monitor they call "network management." But their goal is to sell more modems.

• Multiplexer companies and switch manufacturers all have computer-controlled systems they label "network management." But their goal is to sell more muxes and more switches.

• Computer companies sell host and front-end software packages for "network management." Their aim? To sell more computers and more software.

So although *your* main interest is the network as a whole, *theirs* is just the limited part they sold you. While *your* prime task is to manage the entire network, *theirs* is to sell you more equipment—for completely separate pieces of the network. By using the "network management" label, they make their system sound like a total solution. But it's not.

You can't buy a network management system.

Network management is not a machine. It's a way of doing things. It's the policies, the procedures, the automated tools, and the people you've put in place over the years.

You can't *buy* network management—from anybody. Just like business management, you've got to build it—policy by policy, procedure by procedure, tool by tool, and person by person. When you've done that, *then* you're managing your network.

A new kind of tool.

Sure, all the network management tools are useful, helping monitor, control, and fine-tune various parts of your network. But there's still a big problem: all those separate systems. They don't talk to each other. They don't even use the same control terminals. Today's network operators work with an uncoordinated jumble of CRTs, printers, command languages, databases, and alert logs. The inevitable result is confusion and inefficiency—even in the best-run network control centers.

But imagine if you could control all these tools from a single, centralized workstation. Imagine if you could do away with all those separate screens and keyboards. Imagine if you could reduce the confusion.

Introducing Net/Command—the only network workstation.

Now there *is* a way. A way to monitor and control your network more easily. It's new. It's unique. It's Net/Command, and it features the world's only workstation for network operators. It enables you to access and control almost every other network tool from a single terminal—the network workstation. Everything from host software to modem monitor. From switch controller to multiplexer monitor. From performance monitor to security system. Everything. No matter who makes it.

The Net/Command operator at his network workstation has access to all the tools he needs—on one screen with one keyboard. No more terminals scattered around the network control center. No more rushing from terminal to terminal. No more confusion about who's watching what.

See Net/Command at Interface.

Net/Command is now installed in the control centers of some of the world's largest networks.

See Net/Command at Avant-Garde's booth #2360 at Interface, March 24-27.

Or call: 609-778-7000, Ext. 319
Avant-Garde Computing, Inc.
8000 Commerce Parkway
Mt. Laurel, NJ 08054-2227

AVANT-GARDE

Because networks must be managed.

Net/Command is a trademark of Avant-Garde Computing, Inc.

From **page 29**
tailor service offerings to fit the customer's service requirements?
- Technical competence. How much experience does the vendor organization have in performing these services?
- Reputation. What is the vendor's track record for service performance, quality of service personnel and so on?

Of less importance were factors such as low price, or recommendations of major vendors represented in the network, outside consultants or other customer references.

Upon further analysis of the user survey data, it became clear that significant psychological and cultural differences exist between a service-sensitive group and a service-insensitive group of customers. The service-sensitive group is defined as those users who show high interest in the newer, more advanced network support service products. The service-insensitive group is defined as those users who show little interest in the newer, more advanced service products.

The service-sensitive group attaches greatest importance to selection factors such as responsiveness, reputation and technical competence, while the service-insensitive group attributes greatest importance to selection factors such as competitive bids and recommendation of outside consultants, other customers and vendors.

Vendors will want to adopt different selling strategies for service-sensitive vs. service-insensitive customers.

Single-source service for nets

One idea that is receiving lots of attention today is that of a single-source network service provider. This concept calls for a service vendor to:
- Identify and isolate any and all faults occurring on a network;
- Notify the responsible hardware and software vendors;
- Repair or manage the repair of the fault;
- Monitor progress of repairs and escalation of problems;
- Test the final solution and verify restoral of network operation.

Some customers find this concept intriguing because networks are increasingly becoming a multivendor proposition (see figure on Page 26). Network users are now dealing with many vendors and think that they will be dealing with more vendors in the future.

As a result, customers are becoming more receptive to a service management concept that could potentially result in reduced finger pointing among vendors when network problems occur, lower service costs and more timely resolution of network problems due to better coordination of repairs.

Despite the allure of such a concept, some users have grave doubts that any vendor could pull it off. There are too many other products to be knowledgeable about, too many parts to get hold of, too many software changes to be made aware of and too many complexities for one vendor to deal with.

However, there is already evidence that a few leading edge vendors are experimenting with single-source service and support for networks.

> *"The good news for customers is that vendors plan to offer a potpourri of new services."*

When a few of these vendors have successful experiences with single-source service and support, customers may perhaps become less skeptical about the feasibility of such a concept and more convinced about the tangible benefits resulting from this concept.

Furthermore, a number of vendors are in the process of developing the technologies necessary to offer such a service on a cost-effective basis, for example, network management systems and fault diagnosis software.

Vendors have recognized that network support is a problem area for customers and yet represents opportunities for themselves. One opportunity is in generating more revenue. Another opportunity — and possibly far more important in the long term — is the influence or control a vendor may establish over an account.

The good news for customers is that vendors are aggressively planning to offer a potpourri of new services and investing in training and systems to support their customers. There also appears to be plenty of competition for users to choose from, and competition will generate stronger services at competitive rates.

For those customers struggling with network planning and support issues, help is on the way.

Get your network under control
See the newest network control equipment — FREE!

—Attend—

NETWORK MANAGEMENT TECHNICAL CONTROL

April 2-3, 1986
California Mart, Los Angeles
Boston, June 11-12 — Dallas, October 22-23

The place to see and be seen

NM/TC '86 is a technical conference and exposition for network management professionals. It's the place to go for the inside word on strategic planning, diagnostics, multicarrier/multivendor problem solving, test and measurement systems, vendor selection criteria, and more. And it's where you'll meet the industry pros face-to-face.

Attend the Exposition — FREE

See some of the brightest vendors in network management for FREE. Simply complete the coupon below and bring it to the registration area on April 2nd or 3rd and you can have your run of the exhibits.

Learn from top experts

For the third successful year, NM/TC is offering in-depth tutorials and "how-to" seminars to help you with network planning, operations, control, and buying decisions. Call us today at 800-225-4698 for prices and details on the NM/TC conference program.

The state-of-the-art on display

NM/TC's exhibit area lets you personally examine the next generation of network control centers. Management systems. Modems and multiplexers. Matrix switches. Protocol analyzers. Diagnostic and test systems, and more. Plus you're free to "talk technical" with knowledgeable vendors who understand your networking problems.

NM/TC Sponsors:

General DataComm Inc.
Racal-Milgo

***NM/TC Exhibitors:**

ADC Telecommunications, Inc.
Atlantic Research Corp.
Bytex Corp.
Connections Telecommunications
Design Development, Inc.
Digilog, Inc.
Digital Communications Associates
Digitech Industries, Inc.
Hekimian Labs
Infotron Systems Corp.
Northern Telecom/Spectron Div.
Telecommunication Products + Technology
Telenex Corp.
Venator Systems

* As of 1/15/86

NM/TC is brought to you by the COMMUNICATION NETWORKS show team and is managed by CW/Conference Management Group, a division of CW Communications/Inc., publishers of *Computerworld* and *Network World*, 375 Cochituate Rd., Box 880, Framingham, MA 01701.

FREE ADMISSION COUPON

NETWORK MANAGEMENT

Fill out this coupon completely and bring it to the registration area to be admitted to the exhibits-only for FREE.

Or call
800-225-4698
for more information.

NW1

This coupon entitles bearer to FREE exhibits-only registration at NM/TC. Valid April 2 (9:15 AM - 5:30 PM) or April 3 (9:15 AM to 4:00 PM) at the California Mart, 110 E. 9th St., Los Angeles, California.

Name _____
Title _____
Company _____
Street _____
City _____ State/Zip _____
Phone _____

SPECIAL SECTION

▶ JUGGLING RELATIONSHIPS

Assuming a new identity

BY BRADLEY O'BRIEN
Special to Network World

Since the highly publicized 1984 divestiture of AT&T, communications managers have found themselves increasingly in the spotlight in many organizations. Corporate communications budgets have ballooned, and communications managers face a rapidly changing array of relationships with their internal users as well as their external suppliers.

However, while these developments are ultimately good for the communications industry and for managers' careers, few managers are positioned or prepared for the changes they face.

Communications managers, more than most professionals, come from a wide range of backgrounds. And communications managers in organizations within the same industry are faced with widely differing problems and requirements.

One common misunderstanding is that the communications staffs of larger organizations are necessarily larger and better qualified than those of smaller organizations. This is not so. Communications managers are faced with two different forms of relationships — one internal and one external. Their internal relationships are characterized by a Rodney Dangerfield-like lack of respect from their customers. In their external relationships, communications managers are revered by their vendors as Santa Clauses with big budgets.

While such relationships are by no means universal, often there are underlying justifications for their existence, as in the following examples of internal relationships:

■ *End users.* The vast majority of the relationships communications managers have with end users occur in a trouble mode. Something isn't working, or something is late. Historically, communications; particularly voice communications, has been a commodity-like service that, paradoxically, is most visible when it is not available. As with baseball umpires, the communications manager is most successful when he is invisible.

But this situation is changing. Users are becoming more aware of the utility and the power of good communications and the advantages that it can provide them in their jobs. They are also, because of the general publicity, becoming aware of some of the additional communications capabilities they could have. This is producing a number of knowledgeable and demanding users, a situation with which, historically, few communications managers have been prepared to cope.

■ *Management.* Communications has always been an expense item to management, much like heat, floor space and coffee breaks. It is a budget line to be controlled and even reduced, if possible. Recent uncontrollable and unpredicted increases in communications budgets have severely strained the communications manager's relationship with management.

With the exception of some information industries, such as banking and publishing, few corporations can translate communications into a competitive advantage comparable to sales or manufacturing.

But this too is changing, usually from the bottom up. End users are asking questions like, "What if we connected our reservation system to travel agents?" and "Why can't we connect our suppliers into our purchasing system?" The communications managers who are prepared to answer and encourage such questions are altering the management relationship in their favor.

■ *Communications staff.* Most communications staffs are grossly underequipped for their current responsibilities, both qualitatively and quantitatively. In many cases, the staffing issue is a holdover from older, simpler days when communications management was an office management function.

The end result is that most communications staffs spend their time resolving problems. Not only is there insufficient time to plan for the future and answer "What if?" questions, there is not enough time to plan how to accelerate the problem-solving process.

■ *Data processing.* In most organizations, voice and data communications are still distinct entities, even though they may be part of the same corporate information department. Most commonly, the corporate communications manager is not responsible for data communications.

Furthermore, the responsibility for data communications is frequently spread over a number of individuals within the DP function, with one handling hardware and a separate organization or individual handling software.

In most large organizations, there are multiple data communications managers; there may be one or more for each data communications network.

Oftentimes, the purchase of data lines is delegated to the voice communications manager.

The coordination of voice communications and data communications management in most organizations occurs only at the transmission

Continued on **page 32**

O'Brien is president of Perspective Telecommunications Group, Franklin Lakes, N.J.

From **page 31**
level, if at all, thereby presenting a formidable barrier to the much-discussed integration of voice and data. Perhaps one of the most beneficial outcomes of integrated services, digital networks and the other integration efforts will be the pressure placed on user organizations to integrate these functions.

■ *Their own network.* Because of the pressure to control short-term expenses, the major part of the effort of communications managers has been on those network components that represent the highest cost and/or are most subject to control.

In the past, this has generally meant the long-distance portions of the network. While this concentration continues to be justified, the relative costs of the local components are increasing rapidly, as are the controllable aspects of on-premises equipment.

Ultimately, this means that the communications manager is unable to prepare fast enough for the increasing span of network components over which he must exercise control.

The net result of these internal relationships is that, for most communications staffs, the gap is growing between their responsibilities and their capabilities. In those organizations where this continues, the communications manager will concentrate on problems rather than futures.

To reverse this trend, the appropriate strategy for the communications manager is not simply to address top management, as has often been suggested, but rather to address the interests of the end users.

■ *Vendors.* For years, the communications manager was able to use the crutches provided by the telephone companies, primarily the Bell System.

Staff deficiencies were easily corrected by calling the telephone company for help.

Today's competition has resulted in a long line of vendors. However, these new vendors cannot afford the same level of support capability that AT&T used to offer. Not only are they not the same vendors they were last year, but, in one way or another they will not be the same vendors next year.

For example, Rolm Corp. and other vendors used to underprice their maintenance and support services. Now, they or their distributors are being forced to price closer to cost.

Yet few communications managers have developed sufficient internal expertise to reduce significantly their level of dependence on vendors.

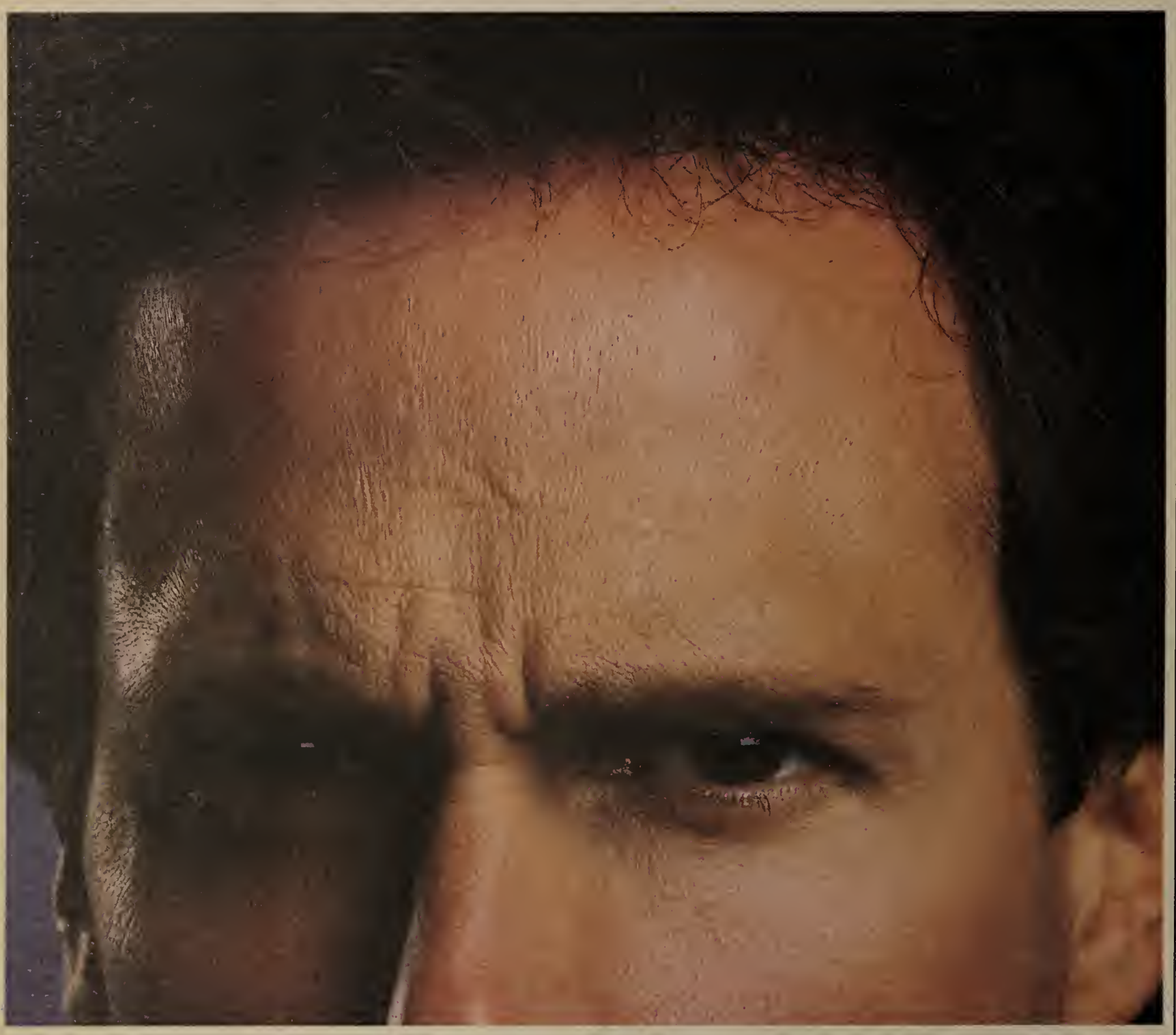
■ *Other communications managers.* The best relationships in the communications manager's world are probably his relationships with other communications managers. Because of the limited number of communications managers, the similarity of their problems and a limited number of common enemies, there is a strong tendency to share experience and expertise.

Strong professional associations exist at the local, national and international levels, and individuals tend to know personally the experts in their field.

Historically, communications managers either came from staff jobs within their organization, such as office management, or from vendors, typically the Bell System. Recently, they have come from other professional occupations, such as accounting or engineering.

Only in recent times have trained communications managers been available from universities and only in very limited numbers. As responsibility and career opportunities increase, a proportional number of qualified candidates will be attracted to communications management.

Nevertheless, the responsibilities and the problems are increasing faster than the supply of professionals. For the forseeable future, the communications manager's problem relationships will get worse before they get better.



"I want to know why the network is down. And I want to know now!"

Is it the mainframe in Atlanta? The switch in London? A communications breakdown? Or an overseas line failure?

Who knows? You will, in minutes, with datacomm test equipment from HP.

Our protocol analyzers will help you track down the source of failure. Right away, you'll know who to call—and where—to fix it.

You can also run digital tests to measure network integrity. And analog tests to check key parameters of the entire transmission line.

If that all sounds too easy to be true, maybe you should call us for a demonstration. Before your network goes down one more time.

Fast answers. Just one more reason Hewlett-Packard's test instruments are right on the money.

Contact your local HP office and ask about a seminar in your area. Or call 1-800-556-1234, Ext. 515. In California, 1-800-441-2345, Ext. 515. Or write to: HP Marketing Communications, DiAne Juarez, P. O. Box 7050, Colorado Springs, CO 80933.

HEWLETT PACKARD

MC15504

SPECIAL SECTION

▶ TIPS FOR MANAGERS

Which hat to wear?

BY EDWARD HORRELL
Special to Network World

Go to any communications-related conference. Walk through the exhibit areas. Spend some time in the hotel bars and hospitality suites.

They'll be there. There is no way to identify them. Some will dress professionally, conservatively.

Others will appear to have dressed in a closet with a burned-out bulb.

They'll be all shapes, all sizes. Some will be old; some will be young. Some will be asking questions; some will be answering.

They're communications managers. They're from all parts of the country and all kinds of companies. And they only come in two types.

Joe Cool is the type of communications manager who is so impressed with technology that he is constantly comparing his company's use of technology with that of his peers'. He lives with a constant challenge to "out-technical" the rest of the communications industry. His greatest feelings of discomfort occur when other companies use technology to solve problems in manners he has yet to discover. Never mind efficiency. He just worries about integrated voice/data terminals, traffic loads, blocking characteristics and any other impressive-sounding jargon he can conjure up.

Joe Cool has no communications plans; he relies heavily on vendors for recommended solutions and alternatives. He lives in fear of admitting that he doesn't understand certain technologies and architectures, so he has much conceptual knowledge with little deep understanding, if any. He is virtually unaware of his users' needs, their costs and their difficulties in achieving any level of efficiency in their day-to-day operations.

The tasks of clerical support are irrelevant to Joe Cool, and he has no grasp of productivity issues. But he loves to have meetings and considers himself a master meeter.

While up to date on the latest rumors and gossip, Joe has no grasp of industry trends. He typically thinks either lowest or highest priced is best and sincerely believes that rate increases from the operating companies come entirely as a result of increases in cost.

As for his own costs, he has no idea how to manage them effectively.

The Joe Cool communications manager doesn't recognize the other type of communications manager. Indeed, he is not aware that the other type exists.

But there is another type, with traits that consistently separate him from his peers. He is the *real* communications manager. Here's who he is:

A real communications manager earns his MBA. This is not a graduate degree awarded by a college or university; rather, it is "Management by Application." This separates the real communications manager from Joe Cool — he who manages from he who *is* managed by technology, or MBT. Applying the "MBA vs. MBT" theory begins to separate the men from the boys. Examples of MBA come from communications managers who concern themselves with the delivery of information and not its movement. In other words, the fact of the delivery is more important than the method. This requires pragmatic solutions, a necessity for MBA.

KEN CONDON

The real communications manager has a vision, a dream of what can be. He calls this dream a plan. It is written and comprehensive. From a communications standpoint, he knows where his firm is, how it got there, where it is going.

He knows his users and their technological requirements. He recognizes problems and looks for solutions; he doesn't develop solutions and then look for problems. He has discussed his plan with senior management and reviews it regularly.

He has a personal plan. He has personal goals and objectives as well as professional targets. He has a strategy for improvement that makes his career a plus for his firm.

The real communications manager knows precisely his corporate communications costs — how and where the money is going. He recognizes seasonal fluctuations. He knows what causes them.

He knows the ratio of communications costs to sales, assets and operating expenses. He tracks his costs in a manner that is understandable and accurate. No surprises. And he tracks efficiency along with costs. Increases in costs without comparable increases in efficiency result in immediate action.

■ The real communications manager presents the image that his corporate family wants to project. Businesslike. Professional. Thorough. Neat. Honest. He makes vendors comfortable in dealing with his department because he represents a professional businesslike approach to problems. Vendors hesitate to go over his head because the real communications manager keeps senior management thoroughly informed. In fact, his vendors don't move upward because no surprises to senior management means no fun to vendors in going upstairs.

Continued on **page 34**

Edward Horrell is president of Mitchell & Horrell, Inc., Memphis, Tenn.

From **page 33**

■ The real communications manager has a one-word motto for dealing with vendors; the word is "fair." All vendors are treated alike. Vendors' prices are not shared among competitors. Phone calls are returned. Results of decisions are communicated promptly and firsthand. Conversations are documented and followed up.

While personable, the real communications manager is careful regarding gifts, trips and related items from vendors. He operates in a manner consistent with company policy and maintains no hidden agendas in dealings with vendors.

Respecting vendor objectives

While respecting the objective of vendors (selling), he understands the awesome responsibility of his role (buying). In this light, he never fails to recognize his ultimate role (using). Never does the buying process override the using process.

The real communications manager has subordinates who wish they had his job. His professional demeanor results in respect for his position. He constantly has a replacement ready to take his job. He sees this replacement not as a threat, but rather as an asset. In this regard, senior management recognizes his readiness for upward mobility.

He shares information with employees. He budgets for continuing education, conferences, seminars and trade shows. He is prudent to see that these perks are shared among employees and strategically timed as rewards for jobs well done. He encourages subordinates to learn all they can. He recognizes that education is vital to the productivity of subordinates, and he does not consider it loafing.

The real communications manager values his time with senior management. He keeps communications jargon to a minimum and instead refers to things that senior management understands: effects on profits, productivity, reductions in operating expenses. He never needs to impress senior management with buzzwords because he is comfortable enough in his position to feel secure.

The real communications manager recognizes that data processing is a necessary function of his business. He is not intimidated by the DP staff. He doesn't feel the need to play word games in a bits vs. bauds shootout.

Similarly, in dealing with peer-level employees within his firm, the real communications manager is not compelled to illustrate constantly the power of his position. He is aware that the power he possesses is great and aspires to use it in a positive manner for his firm. Abuses of this power in forms such as eavesdropping, monitoring calls, or reading privileged reports simply do not occur.

Along with the aforementioned positive attributes of the real communications manager, it's important to draw attention to some actions that are to be avoided at all times. For example:

■ The real communications manager never shoots from the hip. He documents; he keeps good records. He is prepared to answer questions as required. In this regard, he sets an example as to the importance of information.

■ He never releases figures unless they have been triple-checked. He realizes that the easiest way to lose credibility is to have erroneous figures, and he maintains pride in accuracy. Management is comfortable with his data.

■ He never makes decisions that are justified only by reductions in cost. Efficiency is his driving force. He realizes that the days of "hard-dollar specialists" are over and prides himself in this renaissance. In his judgment, success equals efficiency and efficiency equates to profits.

■ He never signs a vendor's contract. He realizes that the effective common ground is between a vendor's printed contract and one that is negotiated by both parties. He is a firm, but fair, negotiator and uses terms and conditions that are equitable, but protect his firm. He knows deal busters and is willing to walk away from a bad deal.

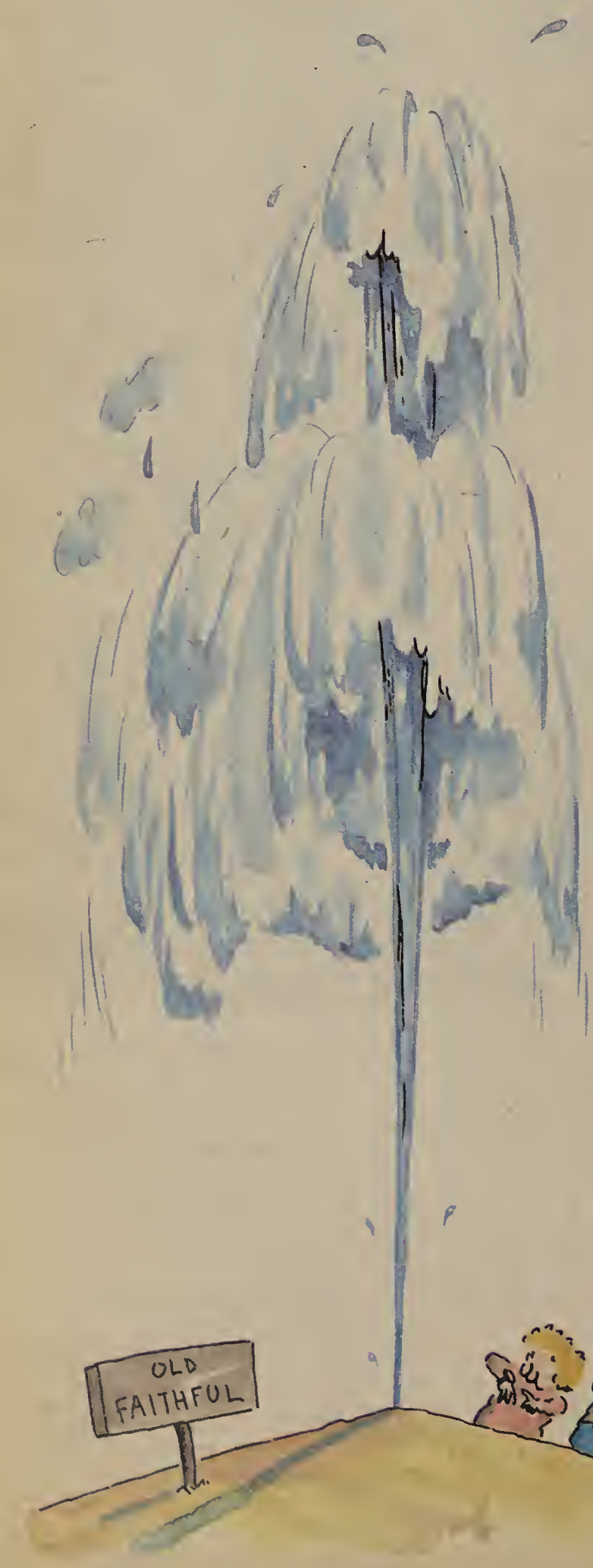
Can the Joe Cool communications manager be transformed into a real communications manager? The answer is yes.

It begins with a thorough mutual understanding between the communications manager and senior management as to the role of the former. Is it cost reduction? Cost containment? Improvements in efficiency? Positioning for cutting edge technology? Joe Cool communication managers don't know the answer. Thus they strain to be everything to their superiors. The real communications manager knows his role.

That's the difference. That's the separation line. That's the best definition of the real communications manager.

Author's Note:

Throughout this article, references to the real communications manager have been in the male gender. The *real* communications manager also recognizes that his female counterparts are equally competent. As such, the real communications manager is just as correctly she as he.



WILL YOU CHOOSE THE WIDE-AREA NETWORK YOU CAN RELY ON TIME AFTER TIME?

If the private wide-area network you select isn't reliable, it isn't anything. That's why it's comforting to know that ever since BBN Communications built the first wide-area packet-switching network in 1969, our systems have delivered an enviable record of availability—on the average, 99.99%.

The reason is simple. BBN networks are fail-safe. If a telecommunications line goes down, our packet switches automatically find an alternate route, and the change is completely transparent to the user.

What's not transparent is the Network Operations Center. Here you can monitor the quality of service using on-line reports and diagnose and isolate failures using built-in tools.

Both our alternative routing approach and our Network Operations Center are unique strengths of BBN Communications. Together they represent a commitment to reliability that convinced major corporations like MasterCard and Wang to choose BBN as their private wide-area network company.

It may well be the reason you should, too.

SHOULDN'T YOU BE TALKING TO BBN?

BBN Communications

A Subsidiary of Bolt Beranek and Newman Inc.

70 Fawcett Street, Cambridge, MA 02238
Telephone 617-497-3268 Telex 921470

Visit us at
Interface 86
Booth # 2414

▶ AUTOMATED TV NEWS

Getting the facts faster

These days, even news reporters are thinking digital.

BY NICHOLAS PASQUARIELLO
Special to Network World

During the 1984 Democratic and Republican national conventions in San Francisco and Dallas, NBC News experimented with a $1-million Broadcast Automation Systems, Inc. (Basys) computer that served as the hub of its news-gathering operations.

This trial run of the Mountain View, Calif.-based manufacturer's products capped a 2½-year search for a news-gathering computer and data base system to serve the information and logistical needs of the broadcaster's global network of 10 domestic and 23 foreign news bureaus.

During the convention, the Basys system was used primarily to coordinate the reporting of breaking news stories and to provide for instant access to biographical sketches of convention participants, as well as other background information. The 160-device system gave producers, writers, reporters and researchers around-the-clock, on-line access to each others' stories and to four major international wire services.

Pasquariello is a freelance writer based in San Francisco.

> *"NBC News had been in the market for a news-gathering computer to coordinate operations since 1983."*

It also enabled them to communicate with other users on nearly 100 terminals in the convention halls.

In addition, the Basys word processing system permitted pre-formatted split-screen video scripts to be entered at will. NBC News was able to train all 100 of its convention staff in the use of this multifunctional data base system in one month.

NBC News had been in the market for a news-gathering computer to help coordinate its worldwide radio and television broadcast operations since 1983. Coincidentally, one of its most progressive affiliates, KRON-TV in San Francisco, had in 1982 become the first broadcast TV station in the U.S. to install a Basys system.

Pleased with the system's performance at KRON and at the conventions, NBC News installed Basys at its news operation in New York during the spring of 1985, recounts Sheldon Hoffman, managing director of NBC News Production Systems.

With the computerized system, everyone involved in news-gathering and production is permitted entree to the same large pool of information at the same time. News staff members, who get most of their information from wire services, can now access those wires via their desktop terminals as much as 30 minutes ahead of their paper- and printer-bound competitors. According to Compton, KRON is the only fully computerized TV news-gathering operation on the West Coast.

KRISTIE VANVALKINBURGH

Despite the coincidence that both NBC News and its affiliate had the Basys system installed at about the same time, they remain separate and only nominally linked systems. Nevertheless, the KRON and NBC News Basys systems have more similarities than differences, and, in fact, are basically the same system adapted to two different scales of operation.

Both the KRON and NBC News systems are supported by multiple minicomputers running Basys proprietary software on the Berkeley Unix operating system. Currently, the NBC News Basys software is installed on minicomputers from Onyx Systems Inc., San Jose, Calif., and Parallel Computers Co., Santa Cruz, Calif. However, Basys plans to migrate its software to Digital Equipment Corp. Microvax II computers in order to support more massive data bases.

NBC News' larger worldwide news staff uses an 80M-byte Onyx disk drive, while KRON's

☞ Continued on **page 36**

smaller, essentially regional system functions quite well with a hard disk half that size.

Networking a television network

NBC News has the maximum configuration that the Basys system can accommodate on one instantaneously accessible data base. All 160 devices on the system can communicate with one another simultaneously while accessing the full contents of the computer's data base.

At both NBC News in New York and at KRON, four CPUs are linked together by a single IBM Personal Computer running Basys proprietary software, which acts as a hub computer, coordinating their traffic flow.

In turn, each CPU has eight communications concentrator units connected to it. The concentrators act as buffers for files on their way in and out of memory storage areas of the CPUs; each concentrator accommodates five devices.

Basys' East Coast operations manager, Rich Piercesall, says that the system's interfaces are standard RS-232 throughout, with 9.6K bit/sec links to terminals and 1,200 or 2,400 bit/sec dial-up connections. NBC News computers are connected via dedicated data lines that support 9.6K bit/sec synchronous communications between selected locations, for example, between KNBC-TV in Burbank, Calif., and NBC News in New York.

"In early '85, NBC News broadcast a week's worth of "The Today Show" live from Vietnam. The satellite links used with Basys required the computer concentrators to be on-site in Southeast Asia"

"We send data in Ascii form and the system on the receiving end periodically sends acknowledgments back," Piercesall explains. "But that changes if we have an AP wire coming in, which is a transmit-only device so we're only streaming in the Ascii files.

"In that case, we don't acknowledge the data coming in. The only place we use acknowledgments is in communications between our concentrators and the central file server, on receive-transmit (RXTX) system-to-system links and on IBM 2780 links.

"We can do an RXTX link over a variety of baud rates," he adds. "We can run that over a pair of dial-ups if we want. For example, if we install a smaller DOS version of our computer system in Fort Worth [Texas] and the main system in Dallas, rather than having a leased line they can use two dial-up lines and do an RXTX link with one line transmitting and the other line receiving at 1,200 baud.

"We do require acknowledgments on that sort of communication. So on any of the big, non-device specific links, where we're transmitting large amounts of data, we do require acknowledgments,." he concludes.

If no phone connections are available, NBC News may, in a pinch, send out text information over Basys' newly installed Telex interface (Telex I or Telex II), which allows direct transmission to the NBC News central computer in New York, Piercesall says.

Today, from Vietnam

In early '85, NBC News broadcast an unprecedented week's worth of "The Today Show" live from Vietnam. The satellite links used with Basys required that the computer concentrators be on-site in Southeast Asia in order to talk effectively to the computer in New York.

Even at the satellite transmission rate of 9.6K bit/sec, it was necessary to place the concentrators next to the terminals in Vietnam, lest an annoying delay echo result from the 20,000-mile round-trip journey the signals made from terminal to computer and back each time a message was sent. In all other cases on Basys, the concentrators are located next to the CPU.

In addition, the 160-device NBC News network is linked to the NBC Radio News network with which it shares approximately 5% of its data base, according to Basys president Dave Lyons. "Radio sends across to the television system all of their scripts plus notes associated with them, and the television side does the nightly news rundown, plus notes and scripts, as well," says Lyons.

The Basys president points out that the only significant limitation of such a shared data base arrangement is that, when the number of devices on-line exceeds 160, top-of-the-screen messages that would normally be instantaneously transferred between terminals are not. Instead, communications between users must be done through a more cumbersome mailbox arrangement.

Also, there is an as-yet-undetermined upper limit on the portion of the data base that can be shared between multiple systems. In theory, if the entirety of two 160-device systems were to share 100% of their data bases, the total system would operate hopelessly slowly. At the Italian Radio Television Center (RAI) in Rome, two 160-device systems, one for radio, the other for television, share about 15% of each other's data bases. At this level of sharing, the total system still functions quite efficiently, explains Lyons.

NBC affiliate automates news

KRON operates what is probably the most fully operational of the approximately 50 Basys computers in use at TV and radio stations worldwide. The KRON network connects bureaus in Washington, D.C. via modem; Sacramento, Oakland and San Jose, Calif., all via dedicated leased lines.

At KRON, the system is used to implement virtually every phase of

Continued on **page 38**

ADVERTISE IN THE ONLY COMPUTER PUBLICATIONS FOR THE PEOPLE'S REPUBLIC OF CHINA.

China Computerworld represents the first joint venture in the People's Republic of China between a foreign publishing company, CW Communications/Inc., and the government. *China Computerworld* is published twice a month and reports on computer hardware and software technologies. The total paid circulation is 65,000. Total readership is estimated at 2,000,000 copies with total distribution of 100,000 copies per issue.

And, now there's *China Computerworld Monthly*, a sister publication to *China Computerworld*, that provides 70,000 readers with even more in-depth analysis of the market.

CW International Marketing Services makes advertising your products in the People's Republic of China, and around the world, easy. We have over 55 publications in more than 25 countries. For more information on our wide range of services, complete the coupon below and mail today.

CW COMMUNICATIONS/INC.
Diana La Muraglia
General Manager
International Marketing Services
CW Communications/Inc.
375 Cochituate Road
Framingham, MA 01701

Please send me more informarion on:
☐ *China Computerworld*
☐ *China Computerworld Monthly*
☐ Your other foreign publicarions

Name _____
Title _____
Company _____
Address _____
City _____ State _____ Zip _____

Fail-safe data communications

Auto dial back-up modems work when your leased lines don't.

When you need fail-safe data communication for your critical applications, you need AJ's auto dial backup modems.

Models are available for 4800, 9600, and 14,400 bps. They continuously monitor the lines. When they sense carrier loss or degradation of signal quality, they automatically dial stored numbers and communications resume over the dial-up line.

They even automatically restore communications to the leased line when conditions improve.

For details on AJ fail-safe data communications send the coupon.

ANDERSON JACOBSON

Please send FREE information on the following:
☐ AJ 4048-2 (4800 bps) ☐ AJ 9601 (9600 bps) ☐ AJ 1411 (14.4 kbps)

Name _____
Title _____
Company _____
Address _____
City/State/Zip _____
Phone (___) _____

Anderson Jacobson, Inc., 521 Charcot Avenue, San Jose, California 95131, (408) 435-8520.

Meet our PC Modems

Choosing a modem for your personal computer just got easier.

Modems are remarkable little gadgets. They can connect you and your PC to mountains of data and oceans of information. But up until now, deciding which modem to buy hasn't been easy. So to solve that little problem, IBM is offering two 1,200 bps PC modems. Modems that not only give you the best features currently available on PC modems, but also offer features usually found only on higher priced, higher speed modems.

First, a Brief Introduction to the IBM PC Modems:

The IBM 5841 is a stand-alone modem capable of operating at 0-300, 600 and 1,200 bps in asynchronous mode, and 600 and 1,200 bps synchronous.

Our other modem is the IBM Personal Computer Modem—an internal, half-card modem that operates at 0-300, 600 and 1,200 bps asynchronous.

The Non-Identical Twins

In some respects, these two modems are very similar. For example, they both have Automatic Adaptive Equalization—which means they will continuously fine-tune themselves to compensate for changes and noises on the telephone line. The result is, you can receive data over a wider range of phone line conditions. This is one of those features more often found on faster, more expensive modems.

In addition to automatic answering, both modems offer Adaptive Dialing—which means that if you don't specify either tone or pulse dialing, the modems try tone dialing for one digit, and if that doesn't work, they automatically switch to pulse dialing.

Both modems will automatically redial a number as many times as you tell them to. Or if you prefer, they can switch to an alternate number on a busy signal or a no answer. Once a connection is made, the modems automatically detect and adjust to the incoming transmission speed. They can also initiate an automatic log-on sequence including control characters, ID number and password.

And both modems have extensive "Help" menus, a complete complement of built-in diagnostics, a programmable speaker, and two phone jacks on the back so both your phone and the modem can be connected to the same line at the same time. You can even switch between voice and data without interrupting the phone call.

A Modem with a Memory of Its Own

The IBM 5841 stand-alone modem has some additional features you don't usually find on 1,200 bps modems. For example, the modem is switchable between asynchronous and synchronous modes and has a 20-entry Dialing Directory. Kept in non-volatile storage, the directory enables the modem to dial up and log on to systems automatically. This feature is most convenient when the 5841 is used with a fixed-function ASCII terminal such as the IBM 3161 or 3163.

The front panel of the 5841 has a complete array of eight LED Status Indicators to give you a quick visual check on what's happening.

A Half Can Be Better Than a Whole

Why? Because the IBM Personal Computer Modem can use a short slot in the IBM PC XT and the *Portable* PC. It also fits nicely into a full slot in the IBM PC and the PC AT.

Another nice touch is that a PC diagnostic diskette comes with each of these internal, half-card modems.

Standards & Compatibility

You'll be pleased to know that both modems meet the Bell 103/212A and V. 22 CCITT standards. Both can use the industry standard "AT" command set, as well as the IBM command set. And both modems have been tested for compatibility with leading PC communications software such as the IBM PC Communications Manager, Crosstalk™ XVI, Smartcom II® and Transporter.™

So if you've been thinking about tying your PC into your company's computer, or accessing an outside data base for stock market information or airline schedules, or using electronic mail, or just exchanging information on a user group's bulletin board—then it's time you got an IBM modem for your PC.

For the Authorized IBM PC Dealer or the IBM Product Center nearest you—or for free literature—call 1 800 IBM-2468, Ext. 596/YU.

Or contact your IBM marketing representative.

IBM®

Stand-Alone.
The IBM 5841
1200 bps Modem

Internal.
The IBM Personal Computer
1200 bps Modem

Crosstalk and Transporter are trademarks of Microstuf, Inc. Smartcom II is a registered trademark of Hayes Microcomputer Products, Inc.

3-24

IBM
DRM, Dept. YU/596
101 Paragon Drive
Montvale, NJ 07645

☐ Please send me information on the IBM PC Modems.
☐ Please have an IBM marketing representative call me.

Name_____ Title_____
Company_____
Address_____
City_____ State_____ Zip_____
Phone_____

AUTOMATED TV NEWS

From **page36**

TV news production. The 72 terminals provide writers, reporters and producers with ready on-line access to six major wire services — AP, UPI, AP Data Features, Bay City News, National Weather Service and the NBC Affiliates Wire — on a 24-hour-a-day, year-round basis. All reporter assignments, shooting schedules and policy and procedures are prepared using the Basys computer.

In addition to laying out stories on the computer, writers can use a special video script word processing program that permits rapid entry, display and printing of text in the industry standard split-screen format.

Linking 33 NBC bureaus

The NBC News system, by contrast, uses the same word processing software and ties together the network's 10 domestic and 23 foreign bureaus either via modem, at 1,200 bit/sec, or dedicated lines, at 9.6K bit/sec.

Its central data base makes available on-line four major wire services: AP, UPI, Reuters and a German/French news wire. A network assignment desk log describes current stories reporters are working on around the globe, a weekly tipsheet on upcoming events, technical operations information and contacts for remote shoots and satellite linkups.

> *"A number of major users of the system, including KRON and NBC News, have made it clear they are interested in upgrading their present systems beyond the capabilities of those currently available from Basys."*

The Basys computer system is usually configured to accommodate field access via a portable computer such as the Radio Shack TRS-80 Model 100 lap-top computer. Tom Wolzien, NBC News vice-president for special production and design, discloses that 35 of its reporters use the Model 100 for dial-up from the field at 1,200 bit/sec. Many reporters have found the 24-hour wire service access this hardware allows, from any phone worldwide, to be invaluable.

Reporters may also send their stories into the computer from the field. For security reasons, once material is entered into the central system from a Model 100, it cannot be edited or rewritten from the lap-top computer.

Another limitation NBC News reporters experience when using the Model 100 with Basys is that they cannot easily send the mother computer formatted scripts. When scripts are sent from the 100 in the field, they must be rekeyed at the receiving end to insert special control characters in the file.

This is because, says Basys president Lyons, the Model 100 cannot be programmed to send out the special characters that tell the Basys computer to split the screen into left, or video, and right, or audio, sections.

The Basys word processing software, however, does permit any of the on-line NBC News or KRON standard terminals, such as the DEC VT-220, direct entry of video scripts with two keystrokes.

KRON's Compton is the first to point to the enormous efficiencies Basys has brought to his newsroom. "We're happy with the system today. It runs the whole newsroom," he says.

But he believes the recent takeover of Basys by the London-based broadcast news company, Independent Television News (ITN), has slowed the company's response time to user's requests for upgrades to the system. "We're concerned with what it [the Basys system] can do tomorrow," notes Compton.

A number of major users of the system, including KRON and NBC News, have made it clear they are interested in upgrading their present systems beyond the capabilities of those currently available from Basys.

Compton places a high priority on acquiring a system for his station that will integrate the newsroom data base and computer more fully into his department's daily operation. This integration would be accomplished by:

- Automatically setting up a sequence of still pictures stored on videotape;
- Enabling the producer to automatically cue up all of the videotape inserts for the newscast;
- Integrating the newsroom video screen with the computer so that either the stills storer, the character generator or videotapes can be previewed from a single workstation;
- Being able to insert a time code from the terminal while one is making notes from the videotape;
- Doing archiving at the Basys from a separate computer so that, from any terminal on the system, one could peruse the station archive to see when a given story was last covered and what footage is available from that story.

The KRON computerized archive, which presently resides on an IBM mainframe, predates the station's acquisition of Basys by some years.

The station is more than a little anxious to marry the two to take full advantage of its voluminous library of visual material.

A natural corollary of this is the station's desire to access off-site third-party data bases such as the Local Program Network, Mead Data Central's Nexis data base, and Datatimes, a data base of independent newspapers.

According to Compton, Basys is not set up to make use of such data bases. At present, stations that use these information sources must retrieve them through separate terminals and computer systems. An example is NBC News' Burbank bureau, which maintains on-line service to the Nexis data base while at the same time connecting on a separate system to the NBC News Basys service. Neither data base can access the other.

Hoffman has declared that the goal of NBC News is to secure a data base system that will continuously support 600 devices on-line to serve its global network of reporters and bureaus.

Wolzien anticipates having in place an additional 50-device experimental affiliates system that will enable information to be exchanged between NBC News in New York, its bureaus and affiliates nationwide and a third system of 50 devices that will serve the American Almanac program, a news magazine show hosted by Roger Mudd.

To meet the demand for larger systems, Basys is currently working on porting its software over to larger Parallel Computers and DEC VAX computers.

Lyons expects that these larger computers will be able to handle considerably more devices and access large commonly accessible data bases. His expansion plans call for Basys to have fully implemented all of both NBC News' and KRON's wish lists within two years.

The last three years have seen the emergence of the automated television newsroom as a viable alternative to the newspaper, note pad and typewriter office.

NBC News is successfully integrating state-of-the-art equipment into its operation, following the lead of one of its forward-looking affiliates.

The competition among computerized television news services has grown more keen since Basys first emerged in the early '80s. As the viability of these systems becomes more generally recognized, competition among computerized newsgathering organizations will also intensify.

This is bound to result in better, more fully integrated newsroom systems with wider access to a broader range of information resources. As a consequence, the job of the television news producer and reporter should be made easier and the quality of the end product, the news, superior.

Drowning in a sea of tariffs?

OTIS™ can be your low-cost lifesaver.

Since divestiture, there has been a growing confusion about the alternative tariffs that may apply to corporate telecommunications networks . . . tariffs from MCI or AT&T or other common carriers . . . digital vs. analog . . . data vs. voice . . . Intra-LATA vs. LEC access tariffs. The questions and alternatives continue to multiply and become more confusing.

Connections has the answer. OTIS™ (Online Telecommunication Information Service) provides all of the precise cost and availability information you need to plan your network growth. Our EASYPRICER™ allows you to examine your actual circuit costs and your new choices. Both OTIS™ and EASYPRICER™ are available as On-line Dial-in Services.

These new services are totally compatible with the micro-based Connections design software. If you're a Connections MNDS user, you can tie directly into the tariff service. For more information on OTIS™, MNDS network design software, or in-depth strategic and tactical consultation services call us toll-free, **1-800-543-9866.** We'll be happy to throw you a line.

OTIS CONNECTIONS

Connections

Connections Telecommunications, Inc.
322 East Center Street
West Bridgewater, MA 02379
(617) 584-8885

1-800-543-9866

▶ CONTINUED FROM PAGE ONE

Ford revs up its factory act

its modern factories and dealerships worldwide. Communications at Ford is a highly decentralized affair that is run as part of a central Information Resources Management team. That group's

realm of responsibility runs the gamut from telecommunications and computer hardware to office automation and shop floor planning for 350,000 employees worldwide.

By streaming the majority of its communications through a local operating company central office switch, Ford earned the distinction of being Michigan Bell's largest Centrex user. In addition, Ford has received considerable attention as the *other* major automobile manufacturer laying new groundwork on the foundation of General Motors Corp.'s Manufacturing Automation Protocol (MAP).

Ford's communications managers are trying to create a centralized scheme wherein its huge network would emanate from the Dearborn home base and flow out to remote sites in a fan-like configuration. Locations in Michigan's southeast sector have by far the heaviest concentration of networking tools and communications needs. More than 90% of products ordered, both in-house and from dealers, are ordered electronically and flow into the Dearborn facility via Centrex service. The central office switch service is used for transmission needs within a 50-mile radius of Dearborn.

Traffic that spills outside that 50-mile boundary is typically handled by a regional private branch exchange tied to the Centrex core by T-1 carrier, or 1.544M bit/sec service. The T-1 service provides digitized voice and data for more than 40,000 of Ford's 350,000 employees.

Ford also uses its T-1 circuits as an interface to the out-of-state domestic network. Other high-speed data capability is provided using 56K bit/sec AT&T Dataphone Digital Service. Ford plans to extend its T-1 usage on a nationwide basis to help process data needs that are growing at a rate of approximately 30% every year. Currently, most of the company's national voice and data transport is routed through four major AT&T Enhanced Private Switching Communication Services locations.

L. James Soma, Ford's manager of telecommunications services, says the company's long-distance transmission strategy for users currently hooked up to point-to-point circuits is to migrate them gradually to Ford's own interexchange carrier, Starnet. The facility is an 80%-owned subsidiary acquired in August 1984 through the San Diego-based Ford Aerospace Division. Some Ford voice traffic has already migrated to Starnet, with data communications soon to follow.

"We saved a lot of money when we switched to T-1 carrier," Soma says. "We will still use T-1 and T-3 [44M bit/sec] with Starnet.

"We are taking the plan we use to connect outlying PBXs to Centrex and rolling it out on

☞ Continued on **page 40**

Continued from **page 39**
a national basis."

Leading a Centrex cheer

Ford is one of Centrex's most enthusiastic cheerleaders. G.H. Peterson, Ford's manager of worldwide systems planning, says that over the past year the company had studied the possibility of installing a private network by replacing Michigan Bell Centrex with a PBX.

"Choosing a direction has been tricky. By making the wrong commitment too soon, Ford could wind up with a network with as much chance of success as the infamous Edsel."

Peterson observes that Centrex won out over the cost of choosing, installing and maintaining a PBX, because the central office service — at least in his geographical corridor — was superior in terms of price performance over a PBX solution.

"In a few years, the economies of scale may change," Peterson says of the Centrex and PBX comparison. "Meanwhile, Michigan Bell plans to have digital switches in all of their central offices that will provide us with digital end-to-end service by mid-1988."

Robert C. Everhart, manager of telecommunications planning, says Ford uses local-area networks to connect research engineering and product development facilities because individuals at those sites commonly work on joint projects.

According to Everhart, choosing a direction for local-area networking has been tricky. By making the wrong commitment too soon, Ford could wind up with a network with as much chance of success as the infamous Edsel.

"We plan to have about 12,000 workstations hooked up to local networks in the future, so we are naturally concerned about picking the right direction," Everhart says. "We must adopt a common approach in all our facilities," he adds.

The company is using Sytek, Inc.'s broadband coaxial cable network to transmit voice, data and video throughout what amounts to a classic campus environment. "We want every building to have a cable-based campus local net to interconnect all buildings in some geographical areas — and link connecting buildings outside of those areas with microwave," Everhart insists.

The microwave facilities connect several test track facilities and are used separately as a one-way broadcasting service that serves more than 200 Ford locations. A satellite service is available for voice and full-motion video conferencing. It establishes an uplink via a local television station and connects to world headquarters via a microwave beam.

Linking 150 Ford locales

Ford's media grab bag also includes a Michigan Bell-installed single-mode, fiber-optic link that runs at a 135M bit/sec rate and connects seven major buildings in the Dearborn area. Computer-to-computer communicators run data over a T-3 fiber-optic connector with channel adapters between two major centers in different locations.

Ford's expansive local and national network must reach approximately 150

Continued on **page 41**

NETWORK WORLD

THE WEEKLY FOR LEADING USERS OF COMMUNICATIONS PRODUCTS & SERVICES

Qualification Form for Free Subscriptions.

Please answer **ALL QUESTIONS,** sign and date the card.

Free subscriptions will be accepted only from individuals in the U.S. and Canada with active professional or managerial responsibilities in communications. The publisher reserves the right to limit the number of free subscriptions accepted in any business category. To qualify, you must answer all the questions below completely, **sign and date this form.**

If address has changed, attach mailing label with old address here.
☐ Address Change ☐ New subscription

First Name | Middle Initial | Last Name

Your Title

Company Name

Div. Dept.

Street Address

City | State | Zip Code

Is the above your home address? ☐ Yes ☐ No

I wish to receive a subscription to *Network World:* ☐ Yes ☐ No

Signature _____

Title _____ Date _____

Business Phone (_____) _____

PLEASE ANSWER ALL QUESTIONS, SIGN AND DATE THE CARD.

1 My primary areas of activity. Circle ONE only.
I am involved in evaluating communications (data, voice and /or image) products and services:
1. for *use within my own* company/organization
2. for *resale* to other companies/organizations
3. Both

1a For communications, my primary responsibility is: Circle ONE only.
1. Data Communications
2. Voice Communications
3. Both

2 Circle only the ONE title classification which most applies to you.

Company Management
11. Chairman, Pres., Owner, Gen. Mgr., Partner, Director, CIO, VP, Dir. Head of Finance, Admin. Procurement

Communications Management
Data Communications
21. Management
VP, Dir., Mgr., Head, Chief: Data Communications, including Networks, Engineering, Design, R&D, Application Development
22. Supervisory/Staff
Supervisor, Head: Networking, Design, Analysis, Engineering, R&D, Applications, Services
Telecommunications
31. Management
VP, Dir., Mgr., Head, Chief: Telecomm., Voice Comm., including Networks. Engineering, Design, R&D, Application Development
32. Supervisory/Staff
Supervisor, Head: Networks, Design, Analysis, Engineering, R&D, Applications Services
Factory Communications
41. Management
42. Supervisory/Staff

MIS/Data Processing
S1. Management
VP, Dir., Mgr., Head, Chief: MIS/DP, Systems Application Development, Operations, Office Automation
52. Supervisory/Staff: Supervisor, Head of System Design, Analysis, Applications

Others
7S. Consultant
80. Educator
8S. Financial Analyst
90. Marketing/Sales
9S. Other _____

3 Job Function
Which one of the following best describes your functional involvement with communications (data, voice, and/or video) products? Circle ONE only.

Corporate
1. Business Management, Planning and/or Development

Communications System/Network
2. Management, Planning and/or Development
3. Implementation and/or Operation
4. Other _____

4 Which one of the following best describes the primary business activity of your organization at this location? Circle ONE only.

Consultants
11. DP/Communications Consulting Services
12. Consulting Services (except DP/Communications)

End Users
13. Manufacturer (other than computer/communications)
22. Finance/Banking/Insurance/Real Estate
23. Education
24. Medicine/Law
25. Wholesale/Retail Trade
26. Public Utility/Transportation
27. Mining/Construction/Petroleum Refining/ Agriculture/Forestry
28. Business Services (excluding DP/Communications)
29. Government: Federal
30. Government: State/Local

Vendors
41. Carrier: including AT&T, BOCs, Independent Telcos, Public Data Networks, Intern'l Records Carriers
42. Interconnect
43. Manufacturer Computer/Communications Equipment
44. Value Added Reseller (VAR), Systems House, Systems Integrator
45. Distributor
46. DP/Communications Services (excluding consulting)
95. Other _____

5 In which ways do you typically become involved in acquiring communications products (data, voice, and/or video) and services? Circle ALL that apply.
1. Recommend/Specify
2. Identify/Evaluate Potential Vendors
3. Approve the Acquisition
4. None of the Above

6 Check ALL that apply in columns A and B.
A. I am personally involved in the acquisition process (specification, selection, approval) for the following products and services:
B. These products and services are presently in use at this location:

A	B	*Product/Services*
		Computers
☐	☐	01. Micros
☐	☐	02. Minis
☐	☐	03. Mainframes
		Data Communications
☐	☐	04. Communications Processors
☐	☐	05. Comm./Networks Software
☐	☐	06. Digital Switching Equipment
☐	☐	07. Facsimile
☐	☐	08. Modems
☐	☐	09. Multiplexers
☐	☐	10. Protocol Converters
☐	☐	11. Network Mgmt. & Control
☐	☐	12. Test Equipment
☐	☐	13. 3270 Controllers
		Telecommunications
☐	☐	14. PBXs
☐	☐	15. Key Systems
☐	☐	16. Central Office Equipment
☐	☐	17. Integrated Voice/Data Terminals

A	B	*Product/Services*
		Transmission/Network Services Equipment
☐	☐	18. Microwave
☐	☐	19. Satellite Earth Stations
☐	☐	20. Local Area Networks
☐	☐	21. Wide Area Networks
☐	☐	22. Packet Switching Equipment
☐	☐	23. Fiber Optic Equipment
		Communications Services
☐	☐	24. Packet Switching Services
☐	☐	25. Cellular Mobile Radio Services
☐	☐	26. Electronic Mail
☐	☐	27. Enhanced Services
☐	☐	28. Centrex

7 Estimated value of communications systems, equipment and services:
A. which you helped specify, recommend or approve in *last* 12 months? Check only ONE in column A.
B. which you plan to specify, recommend or approve in *next* 12 months? Check only ONE in column B.

A	B		A	B	
1. ☐	☐	Over 10 million	6. ☐	☐	$100,000-250,000
2. ☐	☐	$5-10 million	7. ☐	☐	$50,000-100,000
3. ☐	☐	$1-5 million	8. ☐	☐	Under $0,000
4. ☐	☐	$500,000-1 million	9. ☐	☐	Don't know
5. ☐	☐	$250,000-500,000			

8 Estimated gross annual revenues for your entire company/institution:
Circle only ONE.
1. Over $1 billion
2. $100 million to $1 billion
3. $5 million to $100 million
4. Under $5 million

9 Estimated number of total employees at this location:
Circle only ONE.
1. Over 5,000
2. 1,000-4,999
3. 500-999
4. 250-499
5. 100-249
6. 50-99
7. 20-49
8. 1-19

3A05-36
NWW1
THANK YOU!

PLACE
POSTAGE
STAMP
HERE

Network World
P.O. BOX 1021
SOUTHEASTERN, PA 19398-9979

FOLD HERE AND MAIL TODAY

STOP. Did you do the following:

1. Supply old and new address if address has changed
2. Answer all questions
3. Sign and date form

THANK YOU.

Network World

The Weekly for Leading Users of Communications Products & Services

PLEASE TAPE HERE

From **page 40**

locations dispersed throughout the U.S., excluding the heavy concentration of facilities in southeast Michigan.

But an equal challenge is stringing together the automobile maker's vast international network of manufacturing, sales and administrative facilities that operate with different restrictions on every continent.

Network control can hang by threads because the farther the plant location from Dearborn, the greater the autonomy from the network's backbone.

Because of Ford's status as an international company, Peterson must study closely the varying degrees of regulation within multiple international Postal Telephone and Telegraphs.

"We have no control over Brazil's or Korea's transborder data flow restrictions. At least if something happens nationally, we have ways of giving input," he says.

This reality of standards, or the lack thereof, has thrust the issue squarely on top of Peterson's paperwork pile. It also provides the impetus for Ford's active presence in the International Standards Organization (ISO), the MAP users group, the Technical and Office Protocol (TOP) committee and several public policy groups that interface indirectly with the Federal Communications Commission via the International Communications Association.

"Ford has been experimenting with very small aperture terminals far from the factory floor."

Putting Ford on the map

Ford publicly endorsed the GM MAP protocol in 1984 and indicated to all its suppliers that MAP is Ford's future direction on the factory floor. Everhart says the company's two MAP pilot programs will be operating imminently, and he is currently double-checking that all factories are equipped with broadband coaxial cable.

Both pilot programs are testing MAP protocols up through the Layer 4, or the transport layer, of the ISO's Open Systems Interconnect (OSI) model. Ford plans to test the upper three layers through the file transfer layer shortly, in conjunction with the efforts of the TOP committee.

"It's not a trivial undertaking to implement the OSI upper layers," Everhart observes, "but we are working on a foundation that will ease the transition."

Everhart speculates that the large number of vendors moving into the factory networking product arena will provide ardent pricing competition and bring about a much-awaited cost reduction in expensive factory products.

"The first step in bringing down price performance will be getting the protocols down onto silicon chips," he says.

Ford has also been experimenting with very small aperture terminals (Vsat), far away from the limelight and glamour of the factory floor.

Peterson hopes that the technology will help tie in geographically dispersed organizations such as branch locations or dealerships and save on data or video transmission.

Vsat could replace Net 1000

The Vsat technology could support the same car locator system application previously tested by AT&T's now-defunct Net 1000 service. That job was handed to Tymnet, Inc. If accepted, the Vsats will be used to provide another connection between remote dealerships and the central Ford site.

The chore of running Ford's complex network makes it essential to keep all employees up to snuff in most aspects of communications. But Soma pointed out that the eclectic nature of the communications industry keeps the Ford superusers on their toes when it comes to finding trained employees.

"Competition is fierce, and everyone who is capable also wants the big dollars," he observes. Soma and Everhart have been active recruiters from college campuses, particularly the University of Colorado. Each new employee also must attend Ford's own training program.

Ford has also begun its own summer internship program and is working with the University of Michigan to develop more courses in communications with a bent toward engineering and telecommunications.

Peterson claims that corporate visibility of the communications manager has been heightened because of the use of technology as a competitive necessity.

"It isn't just divestiture that makes the manager more important," he observes. "It is the growing recognition of the use of communications and computers and what it can provide Ford as a strategic advantage. Those are the tools the world's auto manufacturers will do battle with."

SELL YOUR COMPUTER PRODUCTS IN VENEZUELA.

Advertise in *Computerworld Venezuela* and sell your products directly to Venezuela's thriving computer community. According to International Data Corporation, the world's leading information industry research firm, Venezuela is the third largest computer market in Latin America.

Your ad in *Computerworld Venezuela* reaches 5,000 computer professionals throughout Venezuela, including MIS managers, DP staff and computer equipment suppliers. Published every other Monday, *Computerworld Venezuela* reports on the latest developments in hardware, software, terminals and supply products.

CW International Marketing Services makes advertising your products in Venezuela, and around the world, easy. We have over 55 publications in more than 25 countries. For more information on our wide range of services, complete the coupon below and mail today.

CW COMMUNICATIONS/INC.

Diana La Muraglia
General Manager
International Marketing Services
CW Communications/Inc.
375 Cochituate Road
Framingham, MA 01701

Please send me more information on:
☐ *Computerworld Venezuela*
☐ Your other foreign publications

Name _____
Title _____
Company _____
Address _____
City _____ State _____ Zip _____

"I called the service rep to fix our business phone system. His phone was out of service."

"We chose Harris-Lanier. They have a nationwide service network."

FOR YOUR INFORMATION, OUR NAME IS HARRIS

Find out about the business telephone system with the nationwide service network. Call 1-800-241-1706.

HARRIS LANIER

Pro from **page 22**
managed almost exactly the same way as telephones.

Finally, many organizations recognize a need for data switching, but they do not have extensive MIS departments. Yet all of these companies have already developed their telephone network management skills.

The future is integration

All trends point toward the growth of integrated networks such as the Northern Telecom Meridian SL-1 that encompass voice, data, text, graphics and other forms of information. Switching data through a PBX gives managers and users experience with elements of network integration now.

The future of networks is integration, and an advanced PBX that supports universal connectivity, heterogeneous networks and maximum use of existing resources is the ideal first step toward the future for many organizations.

Con from **page 23**

Because voice/data PBXs basically are voice switches, their user interface is optimized for telephones, not terminals. As a rule, both voice and data calls are placed to extensions identified by numbers using a dialing procedure developed for dials and keypads. Computer users, however, generally have full alphanumeric keyboards at their disposal, and would benefit from a conversational user interface that allows resource selection by mnemonic name.

Common carriers seldom are used for PBX-based data communications, and when they are needed, line quality must be assured before considering cost; the data communications professional uses protocols and multiplexing to ensure accurate communications and to control costs.

It appears that adding data support to a voice PBX appeals primarily to those with voice backgrounds, most likely because the PBX salespeople speak their language. The exorbitant cost of adding data to a voice PBX can only be overlooked in the shadow of the cost of providing telephone support for an entire location.

In terms of performance, a voice PBX wastes bandwidth when it supports terminals and lacks bandwidth for computer-to-computer applications. Adding data to a voice switch provides an expensive data network with a poor application fit.

Cabling from **page 22**
terminals could not communicate. The contractor had to install new wiring and conduit before the company could move in, delaying its timetable by more than a week.

Integrated services digital networks also include a wiring scheme. ISDN is not yet fully defined and will not be until 1988. ISDN should stand for: I should do nothing until the concept is fully defined and its total application is fully understood. It is too early to commit to ISDN. Do not fall into the trap of the current marketing hype that implies that it will take care of everything.

What can you do today to establish a management responsibility focused on cabling distribution?

- Assess what is in place in the total cabling distribution. Obtain documentation from the phone company relating to the existing wiring, perform a physical inventory of the existing cabling systems and document the findings. Create diagrams of existing cable distribution.
- Establish an ongoing management software package.
- Establish a long-term plan for the evolution of the current cabling system

These basic steps will provide a sound foundation for organizing and managing an area that can support or cripple an organization's information highway.

Information from **page 23**
form. Queries into those data bases must be made easily and efficiently whenever required.

Before, the corporate communications manager could tailor the communications architecture to his own company's peculiar operating needs; now he must look to the outside world.

External access

Interfacing with data bases is relatively easy because of the nature of the transaction and the few protocols required. However, using information as a strategic weapon requires the capability to interconnect with customers, suppliers and a wide range of third parties.

International standards bodies, electronic data interchange groups and IBM all offer standards that must be a planned part of the communications repertoire. Gateway and interconnection strategies must be planned and perfected.

Information and communications managers should be proactive in understanding how the application of technology can give their companies a strategic advantage. They can demonstrate executive skills by taking leadership.

Network World announces some of this year's editorial highlights.

Network World is the first and only weekly for leading users of communications products and services. Because *Network World* is weekly, our audience of 60,000 purchase-involved communications professionals get the up-to-the-minute news, features and editorial they need to do their jobs more effectively.

If you sell products to communications users, you may want to coordinate some of your advertising with specific editorial, and you'll want to take advantage of bonus distribution at trade shows. Call your local *Network World* sales representative for details.

Issue Date	*Product Focus*	*Special Section*	*Show Distribution*
March 31	High-End Voice-Data PBX		
April 7		SNA Update	
April 21	Data PBX		
May 5		Software Defined Networks	
May 19	Packet Assemblers/ Disassemblers		
June 2		Value-Added Networks	I.C.A. Show Atlanta, GA
June 16	1,200 Bit/Sec Modems		
July 7		Fiber Optics	
July 21	T-1 Multiplexers		
August 4		ISDN	
August 18	Network Management/ Test Equipment		
September 1		Bypass	
September 8			NCC-Telecommunications '86 Atlanta, GA
September 15	Broadband Local Area Networks		
September 22			T.C.A. Show San Diego, CA
October 6		Local Area Networks	C.M.A. Show Long Island, NY
October 20	Baseband Local Area Networks		
November 3		Micro to Mini to Mainframe Connections	
November 17	Communications Processors		
December 1		State of the Art Users	
December 15	Communications Software		

NETWORK WORLD

The Weekly for Leading Users of Communications Products & Services

BOSTON: (617) 879-0700/ NEW YORK: (201) 967-1350 / WASHINGTON, DC: (301) 921-9085/ SAN FRANCISCO: (415) 328-4618 / ATLANTA: (404) 394-0758/ CHICAGO: (312) 827-4433/ LOS ANGELES: (714) 545-7278

A PUBLICATION OF CW COMMUNICATIONS

X.400 from **page 4**

Postal and Telecommunications Administrations (Cept).

The topic of discussion was review specifications for message handling, as submitted by the Japanese telecommunications giant Nippon Telegraph & Telephone .

Rapid agreement among the groups over implementation of the X.400 electronic messaging standard means users "will end up with products faster and at lower cost," according to Marshall Cupp, one of the meeting's participants. Cupp is messaging product manager at Northern Telecom, Inc. of Santa Clara, Calif.

The cooperative effort to define X.400 implementation specs is a first in the history of communications, Cupp claimed.

Until now, countries have implemented standards, such as X.25, independently. This practice has led to incompatibility among products, Cupp added.

The X.400 special interest group has devoted its recent meetings to smoothing out differences among American, European and Japanese implementations. The special interest group has focused on details such as how many people can be addressed, as well as the length of each message line.

By Paul Korzeniowski, senior writer; Mary Petrosky, West Coast correspondent; and Amiel Kornel, international editor/Europe, CW Communications, Inc. international news service.

Northern Tel from **page 6**

ified version of AT&T's Unix System V.

Both the M6210 and the M6110 are built on Intel Corp. 80286 microprocessors and use Intel's 80287 Math Coprocessor. Besides its display console, the M6210 can support up to five asynchronous Ascii terminals using the Xenix multiuser operating system. The M6210 costs $7,395.

The M6110 comes with a 1.2M byte diskette drive and supports MS-DOS 3.1. It can be linked to a DV-1 using the DVLink/PC interface board, enabling it to use the DV-1 as a disk and print server. The M6110 costs $5,840.

Both M6000 workstations are scheduled to be available in June.

Northern Telecom also announced the Meeting Communications Services (MCS) option for the DV-1. The MCS enables up to 24 people to participate in an electronic conference, and it allows those using Meridian terminals to see a graphic representation of the meeting.

Terminal users can generate and transmit screens to other terminal users as well as make and receive other telephone calls simultaneously. The ability to convene conferences between different DV-1s will be dependent on the future availability of X.25 networking interfaces.

Available in July, a 12-port MCS DV-1 option costs $13,500. A 24-port option costs $19,000.

Vsat from **page 1**

Skynet Star Network Service is designed to give users all the components needed for the construction of a private satellite net.

The service will support data transmission speeds of 9.6 bit/sec, 56K bit/sec and 1.54M bit/sec. The carrier will also arrange financing for the user's purchase of remote earth stations through AT&T Credit Corp.

Karl Savatiel, AT&T satellite communications director, said agreements with Harris Corp., of Melbourne, Fla., and RCA American Communications, Inc. will allow AT&T to offer all components of the satellite service.

AT&T inked an agreement with Harris last December that will provide with a variety of earth stations, including 1.2-, 1.8- and 2.4-meter satellite dishes. Savatiel said AT&T had leased two satellite transponders on RCA American's K 2 satellite.

An AT&T spokesman said a communications user with a 500-location network could expect to pay approximately $350 to $400 per month, per location.

He also said that the price would include network design, network management and maintenance, as well as transponder space and earth stations for a seven-year period. All network maintenance will be performed at the AT&T Satellite Facilities Management Center in Hawley, Pa.

Ray Fentriss, executive vice-president of the Stamford, Conn.-based Gartner Group, Inc., said AT&T's potential entry into the Vsat network market would have a positive effect on this portion of the satellite services mart.

"AT&T's entrance will legitimize the [Vsat market]," he maintained.

"AT&T is the kind of company that could remove customers' fears about satellite service quality and continuity. Users are always concerned about the degree to which some start-up companies can maintain commitments they receive from transponder lessors and dish manufacturers, he declared.

"The user will perceive that AT&T, because of its extensive networking experience, would be the ideal supplier for satellite networking applications."

Germantown, Md.-based M/A-Com Telecommunications, Inc. and Equatorial Communications Co. of Mountain View, Calif., have thus far dominated the two-way VSAT market, although several other players have entered the promising arena in the past six months.

M/A Com's customers include Schlumberger Technology Corp., Federal Express, Southland Corp. and Wal-Mart Stores, Inc. Equatorial systems are installed at such companies as Niagra Mohawk Power, Farmer's Insurance Group and Farmland Industries, Inc.

Email from **page 2**

follow to gain access to electronic information during an investigation. The goal is to provide protection for communications technologies that do not fall under existing laws for telephone and written communications.

The legislation was filed by Sen. Patrick J. Leahy (D-Vt.), Sen. Charles Mathias (R-Md.) and Rep. Robert W. Kastenmeier (D-Wis.) last November.

Despite initial concerns raised by the Department of Justice, it has been moving swiftly through Congress.

The Justice Department initially claimed electronic mail and cellular communications were protected under existing postal and telephone regulations. But proponents of the bill convinced the agency that those laws would leave such emerging technologies unprotected.

The Justice Department now concedes that legislation is needed, but the langauge and scope of the bill remain in question.

The department supports the portion of the bill that protects messages in transit, but not those stored in the service provider's data base. The Department of Justice has proposed its own a version of the bill, one that would streamline law enforcement requirements.

The department's concerns lie more with procedural issues concerning how the law would be administered than with the substance of the legislation.

"It's clear that both users and vendors want protection for these types of communications," Copeland said.

User and vendor groups such as the Electronic Mail Association and the National Association of Manufacturers have all expressed support for the proposed legislation. User organizations have also contributed to the draft — including corporations such as GTE Telenet Communications Corp., IBM, AT&T, Citibank and Chase Manhattan Corp.

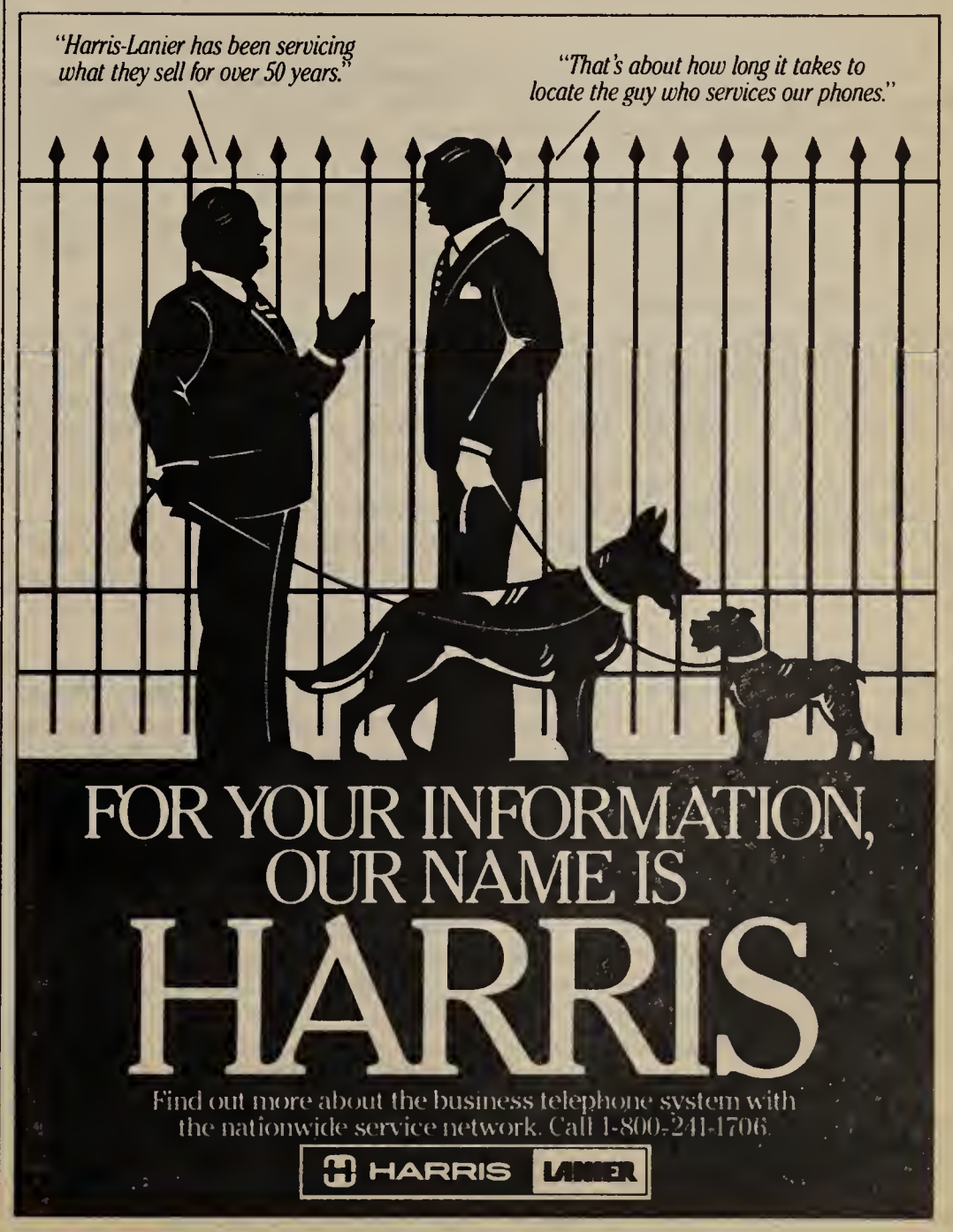
Viewtron from **page 2**

owners were our market."

In a last-ditch effort to build system usage, the company decided to offer Viewtron services nationally last summer and changed its pricing structure a second time, charging subscribers only for system usage. Although Crowsen claimed the moves pushed the total subscriber count over the 20,000 mark, she said, "Usage still wasn't what we hoped it would be."

Gary Arlen, president of Arlen Communications Corp. in Bethesda, Md., said all attempts by newspaper publishers to enter the home market have failed. "The idea of videotex as conceived in the U.S. five years ago was wrong," Arlen stated. "Videotex is not an electronic newspaper."

Arlen said the failure of Viewtron and Gateway has proven that information access is not the most important component of videotex. "Transaction services will be very important in the next generation of videotex offerings," he predicted.



Calendar

March 25-26, New York — Planning the Next Generation of Telecommunications Networks. Also April 22-23, Chicago; May 28-29, Boston. Contact: International Data Corp., Marji Clark, Suite 240, 1500 Planning Research Drive, McLean, Va. 22102..

March 27, Denver — The Complete Voice Mail Workshop. Contact: Teleconnect at (800)542-7279.

April 1-3, Los Angeles — Comdex/Winter '86. Contact: The Interface Group, Inc., Conference & Exposition Producers, 300 First Ave., Needham, Mass. 02194.

April 2-3, Washington, D.C. — Leadership '86. Contact: The Alliance/Conference Information, 2000 M Stt. NW, Washington, D.C. 20033.

April 2-4, Los Angeles — Data Communications. Contact: Center for Advanced Professional Education, Suite 110, 1820 E. Garry St., Santa Ana, Calif. 92705.

April 3-4, Washington, D.C. — Satellite V: Challenges? and Opportunities in Satellite Communications. Contact: Rose Hill, Conference Registrar, Phillips Publishing, Inc., 7811 Montrose Road, Potomac, Md. 20854.

April 7-9, Atlanta — Advanced Data Communications. Also, April 14-16, New Brunswick, N.J.; April 21-23, Washington, D.C.; April 28-30, Boston. Contact: The American Institute, Carnegie Building, 55 Main St., Madison, N.J. 07940.

April 7-10, Washington, D.C. — FOSE '86. Contact: Jackie Voigt-,spelling? National Trade Productions, Inc., 2111 Eisenhower Ave., Suite 400, Alexandria, Va. 22314.

April 7-11, San Francisco — Communications Week '86. Also, June 2-6, New York. Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

April 9-10, Boston — IBM vs. AT&T: Local Network Strategic Issues. Also, April 14-15, Washington, D.C.; April 17-18, San Francisco; April 21-22, Atlanta. Contact: Architecture Technology Corp., P.O. Box 24344, Minneapolis, Minn. 55424.

April 9-11, New York — Advanced Local Telecommunications & The Future of the RBOCs. Contact: Probe Research, Inc., P.O. Box 590, Morristown, N.J. 07960.

April 14-15, Atlanta — T1 Takes Off. Also, May 1-2, Chicago; May 19-20, Washington, D.C. Contact: Janet Shattls,spelling? Delphi, Inc., 20 Passaic Ave., Pompton Lakes, N.J. 07442.

April 16-18, Los Angeles — Local Area Networks. Also, April 21-23, Indianapolis; May 5-7, Philadelphia; May 14-16, Boston. Contact: Center for Advanced Professional Education, 1820 E. Garry St., Suite 110, Santa Ana, Calif. 92705.

April 17-18, King of Prussia, Pa. — Communications: The Link to the Future (NMARC '86). Contact: Larry Thompson or James McLaughlin, Parkway Productions, Inc., 2517 Highway 35, Suite D-202, Manasquan, N.J. 08736.

April 20-24, Chicago — Robots 10. Contact: RI/SME Public Relations, One SME Drive, Dearborn, Mich. 48121.

April 21-22, Washington, D.C. — Telecommunications Update. Also, May 19-20, Marina del Rey, Calif. Contact: J.K. Van Wycks, Federal Publications, Inc., 1120 20th St. NW, Washington, D.C. 20036.

April 21-23, Dallas — COMTEL '86 International Computer and Telecommunications Conference. Contact: Leo Bowser, vice-president, International Conference Management, Inc., 15851 Dallas Pkwy., Suite 1155, Dallas, Texas 75248.

April 23-25, Memphis, Tenn. — Troubleshooting Data Communications Systems & Networks. Also, April 30-May 2, San Jose, Calif.; May 7-9, Colorado Springs; May 14-16, Jacksonville, Fla. Contact: The American Institute, Carnegie Building, 55 Main St., Madison, N.J. 07940.

April 24, Boston — Fiber Optics '86. Also, April 21-22, Newport, R.I. Contact: KMI, America's Cup Ave. at 31 Bridge St., Newport, R.I. 02840.

April 27-30, Crystal City, Va. — Ninth Annual TELUS Conference. Contact: GTE Telenet Communications Corp., 12490 Sunrise Valley Drive, Reston, Va. 22096.

April 28-29, Cambridge, Mass. — Investment Opportunities in Telecommunications. Contact: IGI Consulting, Inc., 214 Harvard Ave., Boston, Mass. 02134.

April 30-May 1, Durham, N.C. — Southeastern Telecom Expo 86. Contact: Jan Doutre, GTE Supply, Lakeside Plaza 2, 5225 Wiley Post Way, Salt Lake City, Utah 84116.

May 1-2, Monterey, Calif. — ISDN CPE: The Next Generation!??? Markets and Technologies. Contact: Arlene Bradford, Probe Research, Inc., P.O. Box 590, Morristown, N.J. 07960.

Advertisers Index

	Page	Telephone Code
Anderson Jacobson	36	
Astrocom	10	
AT&T Information Systems	24-25	
Avante-Garde	26-27	
BBN Communications	34	
Bell Atlantic	16-17	
ComDesign	7	
CompuServe	12	
Connections	38	
CWIMS	36 & 41	
Datagram	14	
Digital Pathways	7	02
General Instruments	18	01
GTE/Telenet	5 & 46	
Hewlett-Packard	32	
Harris/Lanier	41 & 42	
IBM	37	
Interline	48	
Network Equipment Technologies	20-21	
Network Management Technical Control	30	
Network World	42	
Sequel Data	8	
Tautron	47	
Uninet	40	

This index is provided as an additional service. The publisher does not assume any liability for errors or omissions.

TeleRespone Service

TeleResponse is a fast and easy way for you to get the information you want, when you want it.

Adverstisers participating in the **TeleResponse** program have a line reading "TeleResponse No. 1-800-CALL-800 Code ——", appearing under their ad.

When you call.this number, simply give the Service Bureau operator the code number appearing under the advertisement (maximum of ten requests) for which you want information.

For your convenience, the code numbers are repeated in the Advertiser's Index above.

Network World Sales Offices

Robert P. Pavone
National Sales Director

Pam Valentinas
Manager/Marketing
& Sales Operations

Karen Wallace
Account Coordinator
375 Cochituate Road.
P.O. Box 9171
Framingham, MA 01701-9171
(617) 879-0700

BOSTON
Maureen Sebastian
375 Cochituate Road.
P.O. Box 9171
Framingham, MA 01701-9171
(617) 879-0700

NEW YORK
Eleanor Angone
Joseph Viviani
Paramus Plaza I
140 Route 17 North
Paramus, NJ 07652
(201) 967-1350

WASHINGTON, D.C.
Gordon DuChez
20608 Beaver Ridge Road
Gaithersburg, MD 20879
(301) 921-9085

SAN FRANCISCO
Chris Clyne
1060 Marsh Road, Suite C-200
Menlo Park, CA 94025
(415) 329-8220

ATLANTA
Gordon DuChez
1400 Lake Hearn Drive, Suite 330
Atlanta, GA 30319
(404) 394-0758

CHICAGO
Fran Jonikaitis
2600 South River Road, Suite 304
Des Plaines, IL 60018
(312) 827-4433

LOS ANGELES
Christine Clyne
18004 Sky Park Circle, Suite 244
Irvine, CA 92714
(714) 250-1305

Network World is a member of the CW Communications/Inc. group, the world's largest publisher of computer-related information. The group publishes over 50 computer publications in more than 20 major countries. Nine million people read one or more of the group's publications each month. Members of the group include: ARGENTINA'S *Computerworld/Argentina;* ASIA'S *Asian Computerworld;* AUSTRALIA'S *Computerworld Australia, Australian PC World* and *Macworld;* BRAZIL'S *DataNews,* and *PC Mundo;* CHINA'S *China Computerworld* and *China Computerworld Monthly;* DENMARK'S *Computerworld/Danmark, PC World* and *Run (Commodore);* FINLAND'S *Mikro;* FRANCE'S *Le Monde Informatique, Golden (Apple), OPC (IBM), Theoreme* and *Distributique;* GERMANY'S *Computerwoche, Infowelt, PC Welt, Computer Business,* and *Run;* ITALY'S *Computerworld Italia* and *PC Magazine;* JAPAN'S *Computerworld Japan;* MEXICO'S *Computerworld/Mexico;* THE NETHERLAND'S *Computerworld Netherlands* and *PC World;* NORWAY'S *Computerworld Norge* and *PC Mikrodata;* SPAIN'S *Computerworld Espana, PC World* and *Commodore World;* SWEDEN'S *ComputerSweden, Mikrodatorn,* and *Svenska PC World;* SWITZERLAND'S *Computerworld Schweiz;* THE UNITED KINGDOM'S *Computer News, PC Business World,* and *Computer Business;* VENEZUELA'S *Computerworld Venezuela;* the U.S. *Amiga World, Computerworld, inCider, Infoworld, MacWorld, Micro Marketworld, PC World, Run, 73 Magazine, 80 Micro, Focus Publications* and *Network World.*

CAREER ANNOUNCEMENTS

This is a sampling of our Classified Advertising section. For more information on Classified Advertising please fill-in and return the form below or contact Network World, Advertising Department at CW Communications, Inc., 1-800-343-6474 or in Massachusetts (617) 879-0700.

Telecommunications Technical Analyst - Senior

Qualifications: Bachelor's D... of five years experience in voice communicat... have been in the systems planning, sys... procurement and implementation in large PABX or... support environments.

3 Columns x 3 Inches

This is a sampl... our classified advertising section. This is a sampling of our classified advertising section. This is a sampling of our classified advertising section. This is a sampling of our classified advertising section. This is a sampling of our classified advertising section. This is a sampling of our classified advertising section.

DATA COMMUNICATIONS MANAGER

If you are an aggressive self... rter who enjoys challenge, we ma... he position for you.

2 Columns x 4 Inches

At least three... al involvement wit... ommunications supp... ooting is needed.

This is ...ing of our classified advertising s... ion. This is a sampling of our classified advertising section. This is a sampling of our classified advertising section. This is a sampling of our classified advertising section. This is a sampling of our classified advertising section. This is a sampling of our classified advertising section.

MANAGER CORPOR... INFOR...

Position is ... developing ar... external inforar... that focus on t... ments.

1 Column x 2 Inches

T... g of our classified ...tion. This is a sampling of our classified advertising sect...

DIRECTOR NETWOR... PLANN...

The qualified can... undergraduate ...g with gradua... preferred. A ... anagement in... switching and ... strong background ... ining.

1 Column x 2 Inches

... our classified advertising section. This is a sampling of o... dvertising section. This is a ... of our classified advertising section. This is a sampling of our classified advertising section.

Manager, Technology Projects - Networks

Seeking experienced manager. The successful candidate will manage a staff of 15 technical professionals as well as provide overall direction on the telecommunications activities associated with our technology center.

You should have 5 ... years experience in telecomm... ...s networking, including ... e and data. Strong proje... gement abilities and prover... al skills.

2 Columns x 6

This is ... g of our classified advertising ... n. This is a sampling of our classifi... advertising section. This is a sampling of our classified advertising section. This is a sampling of our classified advertising section. This is a sampling of our classified advertising section. This is a sampling of our classified advertising section. This is a sampling of our classified advertising section.

TELECOMMUNICATIONS MANAGER

Responsible for engineering analysis of telephone utilities and issues. Requires engineering degree and two years of experience.

Responsible for engineering analysis of telephone utilities and issues. R... uires engineering degree and two years ... erience.

Responsible for engi... sis of telephone utilities and ... engineering degree and ... erience.

2 Columns x 5 1/2

This is a s... ...ssified advertising section. Th... g of our classified advertising sec... is a sampling of our classified adve... g section. This is a sampling of our classified advertising section. This is a sampling of our classified advertising section. This is a sampling of our classified advertising section. This is a sampling of our classified advertising section. This is a sampling of our classified advertising section. This is a sampling of our classified advertising section. This is a sampling of our classified advertising section. This is a sampling of our classified advertising section.

CLASSIFIED ADVERTISING

Information Form

Name_____

Title_____

Company_____

Address_____

_____

Telephone No._____

☐ Please send me more information on Classified Advertising.

☐ Please have someone call me with information.

Return to: **NETWORK WORLD**
Classified Advertising
375 Cochituate Road
Framingham, MA 01701

▶ PRODUCT REVIEW

Codex 6740: Slick switch

Modular stat mux supports 64 I/O ports at 19.2K bit/sec, boasts dynamic buffer allocation, alternate routing.

BY JOHN J. HUNTER
Contnbuting Writer

Codex's new 6740 Nodal Processor is a good-looking, switching statistical multiplexer that brings fairly sophisticated port-selection, port-queuing and alternate-routing services to small- and medium-sized installations.

The new offering is configured and controlled by an Ascii terminal and supports up to 64 I/O ports, each rated at speeds of up to 19.2K bit/sec. The system handles as many as eight composite links, each running at 2,400 to 64K bit/sec. The 6740 provides local and/or remote host port-contention services, as well as limited data private branch exchange facilities.

The 6740 employs a modular architecture built around Motorola 68000- and 6809-based processor boards, each with 32K bytes of shared random-access memory (RAM) buffer.

A board handles up to 16 input channels, and each channel accommodates asynchronous or synchronous (bit or byte) data at rates of up to 19.2K bit/sec. That rate is double what most competitive devices offer. Four such boards can be added, bringing the total number of I/O ports to 64.

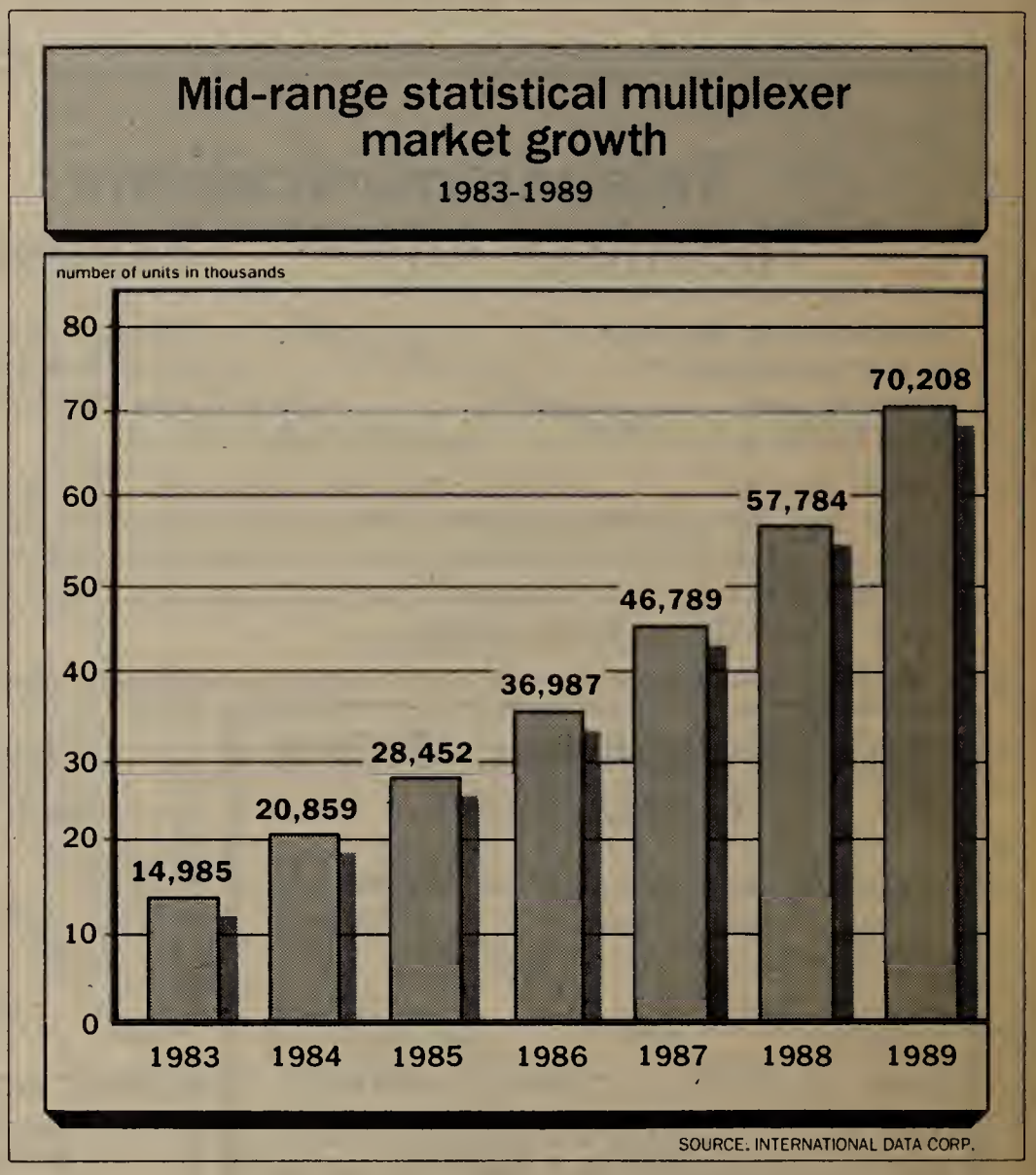
The multiplexer's methods for allocating shared buffer space and servicing high-priority channels look pretty good. Alternate routing and port-queuing services could stand some improvement, however. Codex has chosen to use dynamic buffer-space allocation — as opposed to fixed-partitioned areas — to handle terminal inputs during periods when the composite link is overbooked. The danger with dynamic allocation is that terminals with higher data rates can use excessive amounts of available buffer, thus depriving other users of their full share.

To prevent this, some products assign fixed-partitioned buffer space to each terminal. Codex, however, feels that technique can be wasteful, since all terminals may not be making effective use of their areas.

To handle excessive users, the 6740 assigns an upper limit on the amount of buffer any one terminal can use. This ensures that the higher-speed terminals get acceptable amounts of storage without depriving the lower-speed units of space when they need it.

While the 6740 employs no formal scheme for placing terminals into service priority classes, terminal users are handled by having the multiplexer's channel scanner "poll" certain terminals more frequently than others, thus giving them a larger portion of the high-speed link.

Such action, however, does not exclude lower-priority terminals from access, since every terminal is guaranteed a slot in the link composite.



This same guarantee carries over during alternate routing, when more terminals are competing for less bandwidth.

Alternate routing is a great concept, provided some means exist for ensuring that channels containing sensitive material, like personnel information, cannot overtly or covertly be read at the alternate site.

Codex's solution is to bypass the alternate node's control logic, making it impossible for even the supervisor's terminal to read the information.

While it's hard to fault such logic, no pun intended, some customers might still find it preferable to have the option to block channels from the alternate routing process altogether and have them routed to their original destination through automatically invoked dial-backup services.

The 6740's port-selection and port-queuing facilities are among the better ones around. To ensure that users do not access unauthorized ports, they are placed in specific classes and can access only those ports associated with the class.

One of the most frustrating situations a user of a port-sharing system encounters is entering a queue and not knowing how many others are ahead of him. Most switching statistical multiplexers have no means of providing position location, so the user waits, and remains unproductive, or logs off.

The 6740 is one of the few products in its class that provides position information.

It does not, however, allow a user to be moved forward in the queue. This would be a worthwhile enhancement for two different reasons.

First, it would allow a high-priority user who inadvertently ends up in a queue to get faster service; and second, it might reduce the number of ports normally dedicated to service such users.

The 6740 is the only product in its class to offer redundant control logic and power supplies that automatically take over should the primary units fail.

That's a real plus for any medium-sized multiplexer, and almost mandatory for a product that might end up in a branch office where technical support is not readily available.

The 6740, with 16 channels and two high-speed links, costs $6,000, plus another $3,000 for switching and port camp-on capabilities. Redundant power and control logic runs another $1,800. It's not the most inexpensive unit available, but not that bad considering the facilities provided.

INVITATION

You are cordially invited to attend the
9th Annual meeting of

TELUS

The Telenet Users Association

April 28-30, 1986
Crystal Gateway Marriott
Crystal City, Va.
(near National Airport, Washington, D.C.)

Sponsored by: GTE Telenet

FOR REGISTRATION INFORMATION CALL:
1-800/TELENET (800/835-3638)

Open only to customers of GTE Telenet Communications Corp.

GTE Telenet

Tau-tron's Intraplex T1 Multiplexer Network Solution "Keeps You In Touch."

Call our Networking Consultant 1-800-TAU-TRON Ext. 908 (outside MA) or write to:

tau-tron
A UNIT OF GENERAL SIGNAL

10 Lyberty Way, Westford, MA 01886
(617) 692-5100

We Have An Escape Plan.

Running your company's phone system is more than a job. Considering all the demands it can make on your time, it's practically a jail sentence.

Fortunately, Interline has a plan to set you free.

With a single call to your Interline representative, you can get a multitude of things taken care of. From installation, maintenance and repair of your equipment; to moves, adds and changes to your system.

Our technicians have experience with a broad range of systems and equipment. And they're ready to apply that experience in every part of the country.

If you've been taken prisoner by your phone system, keep in mind that you're entitled to one phone call. We suggest you use it to call Interline.

Chances are, we can help you escape.

Or at the very least, get you some time off for shrewd behavior.

Call 1-800-228-0065 toll-free.

In Illinois, call (312) 654-8500

Or mail to: Interline Communication Services, Inc.
1100 Jorie Blvd., Suite 310, Oak Brook, IL 60521

☐ *Please send me your free booklet explaining how Interline can help my company and set me free.*

☐ *Please call me to arrange a meeting with an Interline representative.*

Name ☐ *Mr.* ☐ *Ms.* _____

Title _____

Firm _____

Address _____

City _____ *State* _____ *Zip* _____

Phone ( ) _____

INTERLINE

A USWEST Company

NW 3.24 86

©Interline Communication Services, Inc. 1985.